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TRANSACTIONS & STUDIES
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Trends in Research on Opiate Addiction[1]

By HARRIS ISBELL, M.D.[2]

DISCUSSION of trends in research on opiate addiction before an audience of internists is not an easy matter because addiction is more than a medical problem. It is a complex process in which pharmacological, psychological, socio-economic and legal factors play interdependent roles. Addiction is viewed in two ways: (1) pharmacologists and internists usually regard it as a specific entity which merits description as a distinct disease; (2) psychiatrists think of it as a symptom of an underlying personality disorder. Something can be said for both points of view. Psychiatric studies have shown that the majority of addicts have personality disorders which historically antedate drug use. Also, addicts tend to use many drugs and to change from one to another, especially when their favorite drug is difficult to obtain. Drugs used by addicts also have very diverse actions. Addicts use not only drugs that cause "depression" (agents that induce drowsiness and sleep), but also stimulants (drugs that induce wakefulness, anxiety and tension). The only common denominator among drugs abused by addicts seems to be that they all are compounds which exert powerful effects on the central nervous system. These facts suggest that there is nothing specific about the drugs that addicts take and, therefore, addiction is nothing more than a symptom of the personality disorder.

This view cannot be accepted without reservations. Although addicts use many drugs, they generally have a preference for one specific agent and, if this particular compound is available, it is used to the exclusion of the others. The theories of personality that are used to explain addiction are the same theories that are used to explain the neuroses, the psychoses, the character disorders, hypertension, ulcer, etc. Since it is known that many persons with personality characteristics similar to those of addicts never abuse drugs, it is apparent that factors other than personality must be operating. Furthermore, under conditions of equal drug exposure, one individual may choose opiates, another alcohol. This implies some sort of specificity in the choice of the drug of addiction. The drugs regarded as addicting also induce typical constellations of symptoms both during chronic intoxication and sometimes on withdrawal of the drugs. These syndromes constitute definite clinical entities which differ from one another. For example, abuse of cocaine leads to the development of a toxic psychosis, whereas the use of opiates does not. Tolerance and physical de-

[1] Nathan Lewis Hatfield Lecture XL, College of Physicians of Philadelphia, 4 January 1956.

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pendence are not features of addiction to cocaine, but are extremely characteristic of opiate addiction.

It is very difficult to develop a medical definition of addiction which will cover all drugs that are regarded as addicting. The Expert Committee of the World Health Organization has defined addiction as a condition in which a person compulsively abuses a drug to such an extent that the individual, society, or both are harmed. Characteristics of the condition include a tendency to increase the dose, psychic dependence and, sometimes but not always, physical dependence. It is apparent that this definition is socially oriented. It does not define the kinds of harm or the degree of harm necessary to classify a drug as addicting; this decision is left to the particular society in question.

RESEARCH IN OPIATE ADDICTION

It is useful to describe research on opiate addiction in terms of various disciplines used, although it is realized that these approaches are not independent but related. The major technics used in the study of addiction can be classified as sociological, pharmacological, physiological and psychological.

Pharmacological Approach. The pharmacological approach to addiction might be designated the "classic" approach, since it was the first systematic attack on the problem. In 1929 a Drug Addiction Committee was set up within the Division of Medical Sciences of the National Research Council. This committee felt that, at the time, the most hopeful approach was to attempt to find a drug that would have the pain-relieving power of morphine without its addictive properties. A synthetic chemical laboratory was set up at the University of Virginia under the direction of Dr. Lyndon F. Small. This laboratory made many modifications in the morphine molecule and also synthesized many compounds with central nuclei that had some chemical resemblance to the phenanthrene nucleus of morphine (1). Several hundred compounds were made. These drugs were examined pharmacologically at the University of Michigan by Dr. Nathan B. Eddy, who systematically correlated the effects of alterations in the morphine molecule with changes in the effects of the drugs (2). It was soon realized that testing of the addictive properties of the drugs in human subjects was necessary because of the great differences in the effects of opiates in man and the lower animals. For this reason, a laboratory was established at the U. S. Penitentiary, Fort Leavenworth, Kansas, where most of the addicts serving sentences for violation of the Federal narcotic laws were housed at the time. In 1935, this laboratory was transferred to the U.S.P.H.S. Hospital at Lexington, Kentucky, which had just been opened.

This program produced a large amount of information about the pharmacological effects and addictive properties of various morphine derivatives (2). When we examine the morphine molecule (Fig. 1), we see that it has a central phenanthrene nucleus, a phenolic hydroxyl group at carbon number 3, and an alcoholic hydroxyl group at carbon number 6. It has also a tertiary amine in a special ring. In general, any alteration at position three lowers analgesic activity, increases toxicity, and reduces addiction liability. The prototype of drugs of this type is 3-methoxy-morphine or codeine. On the other hand, alterations at carbon number 6 enhance analgesic potency, increase toxicity, and increase addiction

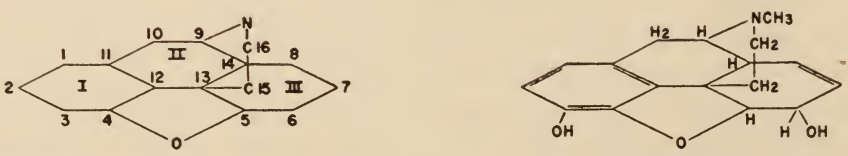

Fig. 1. Structural formula and numbering system of morphine.

liability. The prototype of such drugs is dihydromorphinone or dilaudid in which the alcoholic hydroxyl has been replaced by ketonic oxygen. When alterations are simultaneously made at carbons 3 and 6, the effect of the change at carbon 6 usually predominates thus producing a drug of greater analgesic potency, greater toxicity, and enhanced addiction liability. The prototype of such drugs is diacetylmorphine or heroin. Alterations of the methyl group on nitrogen have peculiar effects. In general, replacement of the methyl group with another aliphatic group reduces activity and addiction liability, or else produces a drug which is an antagonist or antidote for the opiates. N-allylnormorphine, in which the methyl group on the nitrogen in morphine has been replaced by an allyl group, is an example of such an antagonist. One exception to the last general rule has recently been discovered: When the methyl on nitrogen is replaced by a phenethyl group, analgesic activity is markedly enhanced as well as addiction liability.

In the morphine class all the useful drugs discovered have still retained addictive properties and, in general, addiction liability is correlated with analgesic potency.

The pharmacological approach has been greatly affected by the discovery of synthetic analgesics with opiate-like action. For such drugs, the term "opioid," first suggested by Acheson, is useful. The discovery of the first synthetic, meperidine or demerol, created hope that a non-addicting opioid had been found. Unfortunately, such has not been the case. There are five chemical classes of synthetic drugs that possess pain-relieving properties similar to those of morphine, but all five classes of drugs also possess addictive properties similar to those of morphine (3, 4, 5). The five classes in question are the morphinans, the meperidines, the hexamethyleneimines, the methadones, and the dithienylbutenylamines. On looking at the structural formulae of these drugs (Fig. 2), we see that the morphinans chemically are very closely related to morphine and that meperidine and the hexa-

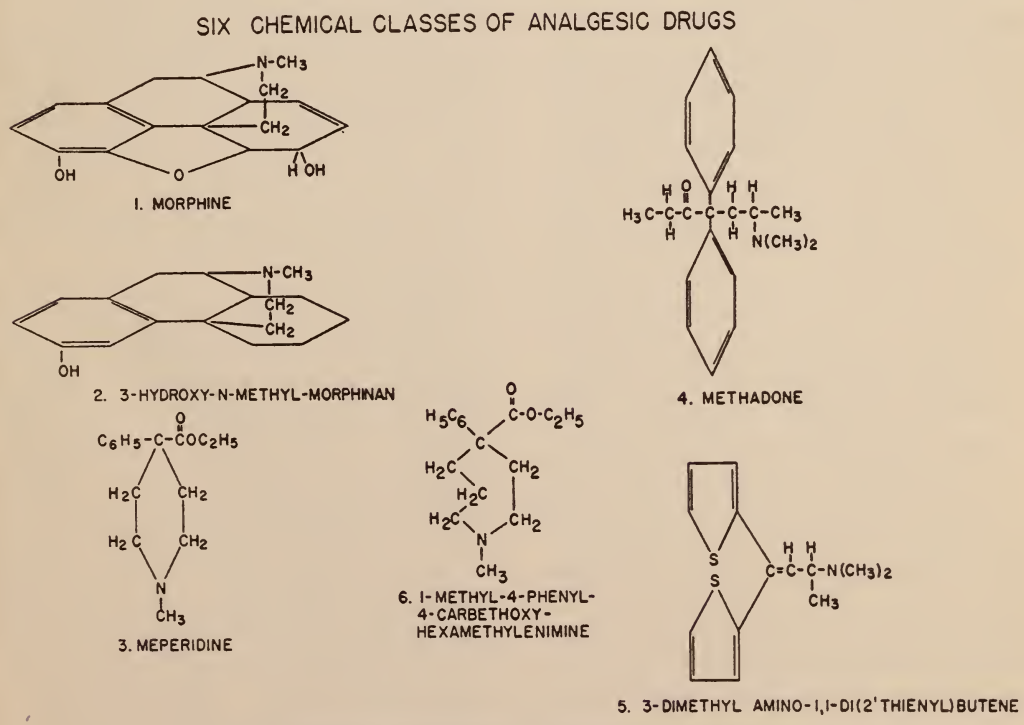

FIG. 2. Structural formulae of 6 chemical classes of analgesics.

methyleneimines are also very similar. Therefore, it might be more correct to speak of four separate chemical classes rather than six. At first glance there seems to be very little similarity in chemical structure in these chemical families. One might, therefore, infer that, since addiction liability and analgesia have followed each other in these diverse structures, the chances of developing a non-addicting pain-relieving drug are remote. If molecular models are made, a similar central phenylpiperidine structure can be made out in all the classes which may mean that this particular type of chemical structure is always associated with analgesia and possibly with addiction liability.

The opioids have been discovered in two ways both of which automatically select drugs with morphine-like properties: (1) by synthesis of a chemical structure closely related to one already known, and (2) by accident. Examples of the first kinds of compounds are the morphinans, which resemble morphine, and the hexamethyleneimines, which resemble meperidine. The remaining classes, meperidine, methadone, and the dithienylbutenes were discovered by accident. In routine screening, these drugs, which were synthesized for entirely different purposes, induced the Straub reaction, a characteristic morphine-like effect, in mice. This led to further examination of the compounds for analgesic activity and other morphine-like effects such as sedation in dogs and excitement in cats. The screening methods by which these drugs have been discovered actually are selecting drugs that have morphine-like properties and, therefore, morphine-like addiction liability. The chances of discovering a nonaddictive analgesic drug seem remote as long as these approaches are used. It would be more logical to avoid agents chemically resembling morphine and to discard all drugs that give a typical morphine-like pattern of effects in animals. A wide variety of substances should be tested for analgesic activity unassociated with other morphine-like actions. Such a program would be extremely expensive and, therefore, will probably not be carried out. Present methods for determining "analgesia" in animals measure in part a spinal cord reflex, and, though known results correlate with clinical pain relief, it may well be that the procedure misses agents that do not affect the spinal reflex but which do relieve pain by virtue of actions at higher levels.

The opiate antagonists are of special interest. N-allylnormorphine does not possess addictive properties similar to those of morphine (6, 7). While this drug is a very weak analgesic in the lower animals, it is reported to be as potent as morphine in relieving post-operative pain in humans (8, 9). We might, therefore, say that the non-addicting analgesic has been found. It, however, may not be a practical analgesic because it induces disturbing mental effects in some patients. Possibly some opiate antagonist other than N-allylnormorphine will have analgesic properties without such serious side effects.

In considering the pharmacological approach one must keep in mind the fact that the development of a nonaddictive potent analgesic would solve only part of the addiction problem. It would eliminate addiction arising from therapeutic use, but it could not be expected to eliminate illicit traffic in such drugs as heroin. Since therapeutic use of morphine, or even of heroin, seldom leads to addiction, a nonaddictive analgesic would contribute little to the solution of the total problem in the United States.

Physiological Approach. Addiction to opiates is characterized by three phenomena: (1) tolerance, (2) physical dependence, and (3) psychic or emotional dependence. By *tolerance* is meant a declining effect on repeated administration of the same dose of a drug, or, conversely, the need to increase the dose of the drug to obtain an effect as great as that observed on initial administration. *Physical dependence* is defined as an altered physiological state which necessitates continued administration of a drug to prevent the appearance of a characteristic train of symptoms, called an abstinence syndrome. *Psychic dependence*, or

habituation, refers to psychological ("subjective") need for the drug as contrasted with "objective," or "physical" need.

Most physiological research in addiction has been concerned with tolerance and physical dependence. Two major hypotheses have been developed. The first is that of Tatum, Seevers and Collins (10) and is based on the dual character of the effects of morphine on the central nervous system. Morphine has both excitant and depressant effects within the central nervous system. In animals, the excitant effects appear to outlast the depressant effects. Therefore, as morphine is repeatedly administered, the excitant effects constantly increase. This excess excitation requires more and more of the drug in order to obtain the desired depressant effects. When the drug is discontinued the excitant effects, which are still present, are unopposed by depressant effects; hence, abstinence symptoms occur. Recently this hypothesis has been expanded (11). It is conceived that morphine exerts its depressant effects by attachment to receptors on the surface of the cell and the excitant effects by attachment to receptors within the cells. The drug at receptor sites on the cell surfaces is in equilibrium with drugs in body fluids, is easily detached and swiftly metabolized. Morphine hypothetically diffuses into and out of cells quite slowly, so that degradation of drug attached at this site is slow. Since drugs on the cell surface are more rapidly dissipated than are drugs within the cells, the excitant effects outlast the depressant. Unfortunately, this concept is completely untestable with present technics, and there are also objections to the "depressant-excitant" formulation. In the lower animals, codeine is a more excitant drug than is morphine. One would, therefore, assume that symptoms of abstinence from codeine would be more severe than symptoms of abstinence from morphine; actually, the reverse is the case. Also, in the chronic spinal dog, morphine markedly enhances—"stimulates"—the ipsilateral extensor thrust reflex. If this is regarded as an excitant action of morphine, the reflex should be even more hyperactive following withdrawal of the drug. Actually, the extensor thrust reflex disappears during abstinence.

The other theory of tolerance and physical dependence was first formulated by Joël and Ettinger (12) and has been further developed by Himmelsbach (13). In this formulation, it is hypothesized that the administration of morphine calls into play homeostatic responses which oppose the effects—chiefly the depressant effects—of the morphine. These homeostatic responses are gradually strengthened by repeated administration of the drug and, therefore, more drug is required to induce the initial degree of effect. When morphine is removed, the enhanced homeostatic responses still remain and are released from the brake imposed on them by the continued presence of morphine in the organism, thus accounting for symptoms of abstinence. This formulation seems to fit the facts. For example, morphine constricts the pupils and depresses respiratory rate and minute volume. When morphine is withdrawn, the pupils dilate and hyperpnea ensues. Many other examples could be cited. In fact, the development of counter responses which oppose the main effects of drugs may be a general pharmacological phenomenon. For example, we know that the barbiturates suppress epileptic seizures. When barbiturates are withdrawn from addicted persons, seizures occur, even though the person is not an epileptic. If one administers atropine to animals over a long period of time and then administers saline instead of the atropine, the animals salivate. If epinephrine is administered daily to a dog over a long period of time, and then saline injected rather than epinephrine, the pulse slows rather than accelerates. The latter two examples are instances of "conditioned" responses. They show that when a drug is used as an unconditional stimulus the conditional response is *opposite* in direction to the usual effect of the drug. It is apparent, however, that the homeostatic theory is more descriptive than explanatory. It tells us what happens but not really how. We have very little knowledge of the mechanisms of the

homeostatic responses that supposedly oppose the actions of morphine. Due to the researches of Wikler (14), we can describe them in neurophysiological terms. In the non-addicted chronic spinal dog, morphine enhances the extensor thrust reflex, depresses the flexor and crossed extensor reflexes, and has little effect on the knee jerk. It can be inferred from these facts that morphine depresses reflexes which are mediated through multineuron arcs (the flexor) and has little effect on reflex arcs that are mediated through a single synapse (the patellar). As tolerance develops, multineuron arcs become hyperexcitable and, on withdrawal of the morphine, excitability in these arcs is unmasked and accounts for withdrawal symptoms. Similar phenomena have been observed in spinal man (15). It is also known that chronic decorticated dogs develop tolerance and symptoms of abstinence on withdrawal of morphine (14). One may infer, therefore, that the cerebral cortex is not necessary for the development of physical dependence. Although these facts give us some concept of the neurophysiological changes associated with addiction we know little about the nature of the changes at levels between the cord and the cortex. Technical difficulties in studying the activity of these levels in chronically intoxicated animals have not yet been solved, but the current trend in neurophysiological research in addiction consists partly of attempts to develop such methods.

Biochemical studies have shown that tolerance and physical dependence are not related to changes in excretion or distribution of morphine within the organism, and are also not due to any known degradation product of morphine. Eisenman and Fraser (16) have shown that maintained addiction causes a decrease in the urinary excretion of 17-ketosteroids, 17-hydroxycorticoids, and of pituitary gonadotropin although the adrenal and the gonads remain responsive to ACTH and chorionic gonadotropin. On withdrawal of morphine, excretion of 17-ketosteroids is increased, serum corticoid levels rise and eosinophile counts decrease. These results indicate depression of the adrenals, the gonads or both by morphine during maintained addiction probably because of depression of the pituitary through unknown central mechanisms. During abstinence, there is a marked adrenal discharge. These findings are very important since they explain the decreased libido and sexual activity present during opiate addiction. The psychiatric significance of this effect requires no comment.

Efforts to elucidate the biochemical mechanisms underlying dependence and tolerance have not yet proved fruitful. Though the technical difficulties are great, studies of this sort are now being pushed.

Obviously, we cannot explain all the phenomena of addiction by physiology alone. Physiological data, though very useful in understanding symptoms and in managing them, contribute to total understanding of problem only insofar as correlation of physiological mechanisms with drug induced changes in behavior are possible.

Psychological Approach. The psychological approach is the most important and the least developed of the methods of studying addiction. Initially, this approach involved studies of mental ability and personality types of addicts. It showed that addiction had no relationship to intelligence, but that it was almost invariably associated, in our particular society, with a psychoneurosis or a character disorder (17). Though not definitely proving it, psychiatric studies of addicts strongly suggest that such mental problems usually precede addiction, play an important role in etiology, and may account for relapse. The theories used to explain the personality problems of addicts have varied in time. Between 1920 and 1940, the most popular theory was symptomatological or psychobiological (18). In this formulation, specific personality reaction patterns are supposed to develop because of specific mental stresses arising from the individual's environment. Such stresses cause anxiety in neurotics who use opiates to allay the anxiety. This is referred to as negative pleasure. Individuals with character disorders, on the other

hand, use drugs not to suppress anxiety but to obtain an elated state called positive pleasure or euphoria. "Normal" persons become addicted only as a result of the use of drugs to relieve physical pain. In this formulation the choice of the particular drug of addiction—marihuana, alcohol, cocaine, or opiates—is an accident and is largely dependent on the drug available. The development of physical dependence is regarded as a complication which is entirely undesirable from the standpoint of the user and important in the total process only insofar as it tends to keep the addiction continuous. Drugs are used after the development of tolerance only to prevent the appearance of abstinence. Relapse after treatment is attributed to the original personality problem. Since 1940, psychoanalytic concepts have been most popular. In this formulation, drug addicts are individuals whose psychosexual development has been arrested or has undergone regression to infantile or even more primitive levels. In infancy and early childhood a strong consistent father figure has generally been lacking, whereas the mother has been over indulgent and rejecting in an inconsistent way. The child as a consequence has been unable to learn that all his wants cannot be fulfilled in reality and has come to regard other persons, particularly the mother or substitutes for her, merely as objects to be used for self gratification. Because of this arrest in psycho-sexual development "oral cravings" become paramount, whereas genital pleasures are devoid of interest. Since in reality such wants never can be fulfilled, frustration results and the narcissistic oral-dependent individual reacts with hostility often toward the mother or other women. Drugs are taken because of this conflict. Predisposition to use drugs is regarded as present before addiction begins. Repetitive use of drugs is ascribed to the predisposition itself and the contrast between the elated state induced by the drugs and the disillusionment which ensues when such effects wear off.

Neither formulation is entirely satisfactory. It is well known that the number of persons who have such psychological traits and are not addicts far exceeds the number of persons with such traits who are addicts. It is also known that, under conditions of equal exposure to both alcohol and opiates, some persons choose alcohol and others opiates, and still others neither drug. For this reason Wikler and Rasor developed a "pharmacodynamic" formulation which is independent of theories of personality structure (19). Different classes of drugs are regarded as having different effects on motivations of a "primary" and "secondary" nature. Opiates are known to have powerful effects on pain, sexual drive, hunger and thirst. In individuals in whom the chief sources of anxiety are related to pain, sexuality or repression of aggressive drives, morphine may fulfill specific needs. Alcohol, on the other hand, is known to release control over (and in this sense, to enhance) sexual and aggressive drives. Therefore, in individuals who characteristically "act out" anxiety—provoking conflicts, alcohol may be the preferred drug. In other words, opiates take away the need for the solution of emotional problems, whereas alcohol permits direct aggressive action against the source or symbols of the emotional conflicts. It is also hypothesized that relief of physical dependence is highly pleasurable since an artificial biological need comparable to hunger or thirst is satisfied. Because of this addicts like to be dependent—"hooked"—and hence the tendency to relapse. In other words, relief of withdrawal symptoms is directly and intensely pleasurable rather than being merely a negative matter of preventing distress. Abstinence symptoms may also be "conditioned" appearing in mild form under stress long after withdrawal.

All the psychiatric formulations of addiction, including the last, are untestable in the classic scientific sense with present techniques. There is, however, reason for hope. Both psychiatry and pharmacology are in a state of ferment with cross fertilization occurring between both fields. This is due in part to the discovery of the "tranquilizing drugs" and in part due to the development of the hallucino-

genic drug, the diethylamide of lysergic acid (LSD-25). To the psychiatrist, these drugs, on the one hand, offer the possibility of therapeutic help for his patients and, on the other, a means of inducing a reversible psychosis in nonpsychotic persons. This has led psychiatrists to begin to grope for explanations of mental disease in terms other than psychological, to seek for evidence of defects at cellular chemical levels and to begin to use controls in their evaluations of the treatment of mental disease. Pharmacologists have become dissatisfied with their older ways of assessing the effects of drugs in the central nervous system. Electro-physiological technics are now finding extensive use in studying drugs, and psychological technics for assessing behavioral changes induced by drugs in both man and animals are being applied widely. Within the last two or three years, growth in the borderline fields of psycho-pharmacology and neuropharmacology has been astonishing. All this work is certain to uncover technics and to yield information of great importance to the study of addiction.

Actually workers in the field of analgesic drugs and drug addiction were groping for such methods long before psychiatry and pharmacology received such great impetus from the tranquilizing and hallucinogenic drugs. Wikler (14) showed that, in dogs, morphine affected the most recently learned and least stable conditioned responses more than the older and more stable responses. Many workers were puzzled to find that in man therapeutic doses of the opiates did not impair perception of pain to any great degree, and all concluded that morphine alters the reaction to pain more than it does perception. Hill, Belleville, and Wikler (20, 21), in cleverly designed experiments, have shown that, in man, morphine reduces anxiety produced by anticipation of painful stimuli, whereas other drugs, such as the barbiturates, do not. This latter concept is currently being investigated in small animals with a large number of drugs. The same workers find that the effects of drugs are greatly altered by the motivational state at the time of administration. Beecher and his co-workers (22) have made extensive clinical studies of the mechanisms of actions of such drugs as the opiates, barbiturates, and amphetamine, and believe that measurement of the "subjective" responses induced by drugs may be as important as measurement of the "non-subjective" responses.

As more knowledge and newer technics become available, great progress in the psychological aspects of addiction are to be expected. In the not too distant future, quantitative information on the effects of opiates on the more subtle aspects of behavior, such as motivation, conditioning of drug effects, conditioning of physical dependence, and so on, should be forthcoming.

Sociological Approach. Although the socio-economic factors that influence addiction do not fall within the field of medicine, no discussion of addiction is complete without some mention of them. Their importance is obvious. It has already been stated that society decides that the abuse of one drug is an addiction and that the abuse of another is not. We know that western civilization regards addiction to opiates as an extremely evil thing, and that the addict is popularly regarded as a sex-crazed murdering fiend. Though such a description of the addict is entirely unjustified and inaccurate, the very fact that society does hold this view, increases the damage that addiction does to the individual. Also rigid control of certain drugs makes them attractive to individuals with unstable personalities, since flaunting the law by use of drugs is one means of expressing hostility and resentment against society. This, of course, is not intended to mean that legal controls should not be used.

Sociological studies have shown that, in New York and Chicago, addiction is most rife in the most economically deprived areas of those cities. In such areas, not only is the incidence of addiction high, but delinquency, alcoholism, schizophrenia, etc., are more common than in other areas. Therefore, the social factors which have been studied seem to

be contributory rather than specific causes of addiction, except insofar as social factors may determine personality structure and therefore lead to addiction. The sociological studies have raised many interesting questions for which we do not have adequate answers. What is the reason that addiction is now predominantly a problem of the negro, rather than a problem of the white as was the case ten years ago? Why is addiction such a great problem in New York and such a small problem in Boston? Why are addicts scattered diffusely through small towns of the rural south, but not through the small towns of the rural midwest?

Sociological research in addiction is now turned from mere classification of the areas in which addicts reside to the study of factors which may be of greater significance. Currently, efforts are being made to contrast the family structures of addicts with those of nonaddicts and to correlate adolescent addiction with the general problem of delinquency.

SUMMARY

1. Efforts to develop a nonaddicting analgesic drug which have been carried on over the past twenty-five years have not been successful, unless the opiate antagonist, N-allylnormorphine proves to be such an agent. Analgesia and addiction liability have been associated in six distinct chemical families of analgesics. A change in the pharmacological screening methods is needed. Drugs which have any chemical relationship to the presently known classes of analgesics should be shunned and drugs which give typical morphine-like patterns of effect in lower animals should be avoided. Drugs that do not produce morphine-like patterns of effect in lower animals should be studied for possible analgesic effects.

2. The neurophysiological and biochemical approaches to addiction have yielded a great deal of information which permits some understanding of the problems of tolerance and physical dependence. Neurophysiological data on the effects of addiction on levels of the central nervous system between the spinal cord and cerebral cortex are badly needed. Useful data on changes in cellular chemistry during addiction are not available. This latter line of investigation should be pursued.

3. The psychological approach to addiction has yielded information on the personalities of addicts and hypotheses concerning addiction in terms of theories of personality. Attempts are now being made to explain the effects of drugs in terms of more exact psychological and neurophysiological mechanisms. Better methods of measuring both types of effects are being devised. Great progress in this area can be expected within the next several years.

4. Sociological research has shown that addiction is associated with economic deprivation. Studies of more subtle sociological factors are now being undertaken.

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Diseases of the Prostate Gland[1]

(Including a Brief Consideration of Hormonal Factors in Normal and Abnormal Prostatic Growth)

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I GREATLY appreciate the honor of having been invited to give the Sixth Benjamin Musser Lecture, and before beginning, I wish to thank those responsible for this invitation. In the preparation of this lecture, I have tried to keep in mind the wishes of the donor of the lectureship, as expressed by the First Benjamin Musser Lecturer, the late Dr. John Herr Musser, II.

During the normal course of events, placental mammals are born with prostate glands. During the last trimester, and for a short time after birth, distinct histological changes can be seen in the prostate which include squamous metaplasia and focal hyperplasia of fully differentiated prostatic epithelium. The prostate gland of the newborn male is distinctly palpable on digital examination through the rectum.

These changes occur at a time when changes also occur in the breast, uterus and vagina of females, and it has been suggested that they are caused by gonadal hormones, derived either from the mother or from the fetal gonads. Sections of the testis of the premature infant or newborn, when stained for lipid, show that the interstitial cells of Leydig accept the stain as in the adult, and suggest that these cells are producing a hormone(s) (1). Shortly after birth retrogressive changes occur in the prostate, and the interstitial cells of Leydig disappear. It is not until the testes again begin to elaborate their hormones at puberty that we again note changes in the size, histology and function of the prostate gland.

Shortly after puberty the prostate gland attains adult size and histologic appearance and begins to secrete its fluid. Whereas the exact function of the gland is not known, its secretion, which constitutes approximately one-half of the total volume of ejaculate, serves as a carrier for spermatozoa and probably provides nourishment for them. Barring the occurrence of inflammation and calculi, few changes are observed during the next 30 to 40 years. Thereafter nodular hyperplasia develops in most glands and carcinoma in many.

It seems certain that man has been plagued with prostatism since his origin. It is difficult to be sure of the first recorded reference to prostatism, but Sir Everard Home (2) in his "Practical Observations on the Treatment of the Diseases of the Prostate Gland", published in 1811, and commonly referred to as "Home on the Prostate Gland", writes, I quote: "From its frequent occurrence, perhaps we may be justified in believing that it is alluded to in the beautiful description of the natural decay of the body, in the Bible, in the book of Ecclesiastes, the 12th chapter, the 6th verse, where it is written, 'or the pitcher be broken at the fountain, or the wheel broken at the cistern'. Expressive of the two principal effects of this disease, the involuntary passing of the urine, and the total stoppage."

It is equally difficult to be certain just what constituted the first form of treatment, though there is a suggestion in the early Chinese literature that "Piqure" was practiced for acute urinary retention, as well as for many other difficulties. Many opiate clysters were applied before the introduction of the catheter,

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and whereas we cannot be certain who passed the first catheter, the Oxford English Dictionary tells us that the word "catheter" did not pass into the English language until 1601.

Cure of prostatism came with the development of satisfactory operations for removal of the prostate, either *in toto* for cancer or stone, or in part, for benign nodular hyperplasia.

The causes of benign prostatic enlargement, calculous disease and cancer remain unknown to this day although many causes of nodular hyperplasia have been suggested in the last several centuries. Thus, in earlier days, the common causes were thought to be: full living of any kind (including making free with the pleasures of the table, inebriety and indulgence to excess with women), horse-exercise, a confined state of the bowels, exposure to cold and prostatic apoplexy.

Most recently a number of workers have been so naive as to suggest that the endocrine secretions—especially gonadal ones—may have something to do with it. After I have finished my concluding remarks which will deal briefly with endocrine factors in normal prostatic growth, especially as they relate to abnormal prostatic growth, many of you, I am sure, will choose to accept as more logical some of the earlier and possibly more plausible theories as to cause, such as horse-exercise.

The four most common conditions of the prostate which we are called on to treat are: (1) chronic prostatitis, (2) benign nodular hyperplasia, (3) carcinoma and (4) calculous disease. I have chosen to talk mainly about hyperplasia and cancer, but before doing so will say a few words about prostatitis and calculous disease.

CHRONIC PROSTATITIS

We are not concerned when confronted with an adult male who presents with minimal or no urinary symptoms, and who, on examination, is found to have a few leucocytes in the first ounce of voided urine, 10 to 20 leucocytes in the expressed prostatic secretion, and no bacteria or a nonpathogen on culture of the urine or secretion. We believe that such individuals require no treatment and advise against prostatic massage, urethral instillations and irrigations. Furthermore, we believe that mild prostatitis such as just described does not constitute an important "focus of infection."

However, we are deeply concerned about the individual with moderate to marked irritative urinary symptoms, whose urine shows many leucocytes, a culture of which reveals a pathogen, whose prostatic secretion shows innumerable leucocytes and whose history suggests pyelonephritis. Such a patient requires treatment. If excretory urograms rule out deformity of the upper urinary tract and cystourethroscopy fails to demonstrate significant pathology of the bladder and urethra, we believe that such a patient is best handled by determining the sensitivity of the pathogen found on culture to numerous chemotherapeutic agents, and prescription of the agent which appears to be best. Often after intensive initial therapy, it is wise to continue to administer small doses of the agent for long periods, particularly if the pathogen is Esch. coli and the agent a sulfonamide. We rarely resort to prostatic massage, irrigations or instillations.

CALCULOUS DISEASE

There are no symptoms pathognomonic of calculous disease of the prostate gland. Symptoms, when present, may be secondary to prostatitis, urethral stricture, or nodular hyperplasia. Occasionally, small prostatic calculi are passed in the urine. Diagnosis is established when crepitation is elicited on rectal palpation of the prostate, when calculi are seen on x-ray, and by endoscopy. According to Higgins (3) about 70 per cent of cases are associated with nodular hyperplasia, and, in our institution, 14 per cent also had prostatic cancer (4). This incidence of cancer is exactly that reported by Rich (5) for men over 50 years dying of causes other than prostatic cancer.

No treatment is indicated when symptoms are absent and infection is minimal and well

tolerated. If symptoms and infection are severe, the treatment we advocate is often guided by the age of the patient. Total prostatectomy affords a cure and is advised in the older age group. In the sexually active male, transurethral resection has proved useful on occasions, but too often all calculi cannot be removed by this method. Recurrent stone formation may occur. If calculi are found in association with prostatic hyperplasia of a degree requiring operation, most calculi can be curretted from the fossa after enucleation of the adenoma.

BENIGN PROSTATIC HYPERPLASIA

Many investigators, including your speaker, believe that some degree of nodular hyperplasia of the prostate occurs in all males over the age of fifty years. Perhaps 20 per cent of men over this age will have obstructive symptoms of some degree. Of these, roughly one-quarter will require operative intervention, or 5 per cent of men over 50 years of age.

At this date the exact nature of the pathologic process involved is imperfect. It appears that the process begins not always, but most often, in the submucous portion of the prostatic urethra, not in the prostate gland itself. Here numerous aglandular fibromuscular nodules are seen to arise. This is followed shortly by invasion of the nodules by epithelial elements, producing stroma-glandular mixtures. In passing, it is of interest to note that the fibromuscular portions of such nodules are thought to arise from the mesenchyme of the genital cord in common with the stromal portion of the uterus.

With time, and under a stimulus unknown to us at present, many of these hyperplastic nodules grow. In so doing, normal prostatic tissue is pushed outward and eventually compressed between the expanding fibromuscular adenoma and the inelastic, anatomic capsule of the gland. In some obstruction to the outflow of urine from the bladder occurs. It is this group which concerns us.

Complete or partial obstruction results in urinary retention, and, in turn, pressure rises in the entire upper urinary collecting system: the bladder, the ureters, the pelves, the infundibula, the calyces and the tubules of the nephron. This rise in intratubular pressure results in reduction in the effective glomerular filtration pressure. Glomerular filtration pressure is further reduced as a result of increased intrarenal tissue pressure causing blood vessel compression and a decreased blood flow (6). Tubular function is also reduced by a similar mechanism (7). In time, profound renal insufficiency may ensue. Consequently, as physicians treating prostatism, our major objectives are two: (1) prevention of renal insufficiency, if possible, and (2) appropriate treatment once renal insufficiency occurs.

In the last 20 years real progress has been made in reducing the morbidity and lowering the mortality associated with the treatment of prostatism. Whereas this can be attributed in part to better surgical technics, blood transfusions, and improved urinary antiseptics, the greatest single factor has been preoperative recognition of an appropriate non-surgical treatment of any degree of renal insufficiency secondary to benign prostatism with urinary retention. This necessitates an understanding of the use of fluid and electrolyte repair solutions.

In treating patients with benign nodular hyperplasia we must ask ourselves two questions: (1) are the patient's obstructive symptoms severe enough to warrant operation? and (2) what has the obstructing prostate done to the kidneys? In the absence of significant residual urine, symptoms are of nuisance value and may interfere with rest, thus aggravating another malady, such as cardiovascular disease; in the presence of urinary retention, as emphasized earlier, renal failure may ensue.

I shall not discuss in any great detail the preoperative management of the uremic prostatic. He needs an inlying catheter, chemical determination of certain constituents of the blood plasma, including nonprotein nitrogen, bicarbonate, sodium, potassium and chlorides, and individualized correction of

any imbalance found. With such a regimen, it is possible to restore most patients to normal, and then and only then, elect to remove the catheter some time after "elective prostatectomy."

Ten to twenty years ago heated discussions were commonplace in urologic circles concerning the choice of operative approach for prostatectomy. Each approach had its advocate. Thus, my predecessor, Dr. Hugh Young, championed the perineal method, Dr. J. Bentley Squier, the suprapubic, Dr. Nathaniel G. Alcock, the transurethral and Dr. Terence Millin, the retropubic.

Now it is commonplace to emphasize all avenues of approach, to teach them to our residents and to insist that they master them all, for it seems clear that best results are obtained by fitting the therapy to the patient rather than the reverse. Each can be performed with good results, providing indications for the particular approach are proper, and with low mortality rates which approach 1 per cent.

CARCINOMA OF THE PROSTATE

I can summarize in a very few sentences what I believe is important in the diagnosis and treatment of prostatic cancer: (1) prostatic cancer is a common cancer; (2) in its early stages, prostatic cancer causes few symptoms, and we must rely on routine rectal examinations for early diagnosis; (3) all hard nodules felt in the prostate gland on rectal examination should be considered cancers until proved otherwise; (4) surgical biopsy is the only reliable means of establishing a diagnosis of prostatic cancer; and (5) total prostatectomy is the only positive means of effecting a cure.

There is an abundance of evidence to support these statements. (1) In a new series of cancer morbidity studies published by the United States Public Health Service (8), and available now for 10 major cities in the United States, we find that cancer of the prostate had the highest *incidence* and *prevalence* in the male and the third highest *mortality rate*. (2) To date, there are no tests of urine, blood or prostatic fluid which establish the diagnosis of early, operable prostatic cancer. (3) Unless one suspects that a hard nodule felt in the prostate gland may represent cancer, clear-cut steps will not be taken to establish the diagnosis. (4) In our experience the accuracy of diagnosis of prostatic cancer by rectal palpation alone is of the order of 50 per cent. Accuracy of open surgical biopsy via the perineal route approaches 100 per cent, and according to Hudson (9) exceeds greatly the accuracy of needle or punch biopsy. (5) To date, there are no reports of cure of prostatic cancer by hormonal methods of treatment or technics involving forms of irradiation. However, some cures have resulted from enucleation of a nodular hyperplastic prostate containing a small carcinoma, unsuspected preoperatively.

In concluding this phase of the discussion, I wish to present evidence in support of the view that total prostatectomy for early prostatic cancer affords the best chance for 10 year survival and with no demonstrable cancer. In 1954, my associate, Dr. Hugh Jewett (10), published an analysis of all cases of prostatic cancer, at The Johns Hopkins Hospital, which were subjected to radical perineal prostatectomy. For purposes of a tenyear evaluation, the series was closed in 1943 and totalled 127 cases. Statisticians inform us that the expected 10 year survivorship for men without cancer in the age group concerned is 53 per cent. It is most gratifying to note that the 10 year survivorship for 41 patients in whom histologic study suggested that the cancer was confined to the prostate was 49 per cent, and all were clinically free of cancer. In 79 men the cancer on rectal examination felt as if it were confined to the gland, and in this group the 10 year survivorship without evidence of recurrence was 39 per cent. When rectal palpation suggested local extension, survivorship fell precipitously to 12.5 per cent and lowered the overall survivorship to 25 per cent. Even this figure definitely exceeds all published figures for 10 year survival following palliative endocrine control.

THE NORMAL PROSTATE

In my introductory remarks, I intimated that certain endocrine secretions regulated development and function of the normal prostate gland and possibly are concerned with abnormal prostatic growth. In the time which remains, I wish to present a number of observations, some of which appear to be facts, which deal with this regulation.

For centuries it has been known that castration, both in animals and man, results in profound atrophy of the normal prostate gland and abolishes its secretion. Two examples follow: In non-castrate controls, total prostate weights average close to 600 milligrams. Five weeks after castration, rats of the same age, strain and weight and fed the same food, show profound atrophy of the gland, the total weight amounting to less than 50 milligrams. Histologically, this atrophy involves both the fibromuscular and epithelial elements of the gland.

Preparation of a prostatic fistula in the dog permits one to study the effect of castration, as well as other endocrine manipulations, on prostatic secretion (11, 12, 13). Castration abolishes prostatic secretion, even though we try to stimulate secretion with a parasympathomimetic agent. Histologic studies of such castrate-fistula preparations show atrophy of both the fibromuscular and epithelial elements of the gland. Such effects can also be produced by other manipulations which include hypophysectomy, the administration of estrogenic substances and certain other steroids.

The atrophy which follows hypophysectomy in the rat is somewhat greater than following castration, though the explanation for this observation is not clear. Both in the normal rat and dog, the administration of estrogenic substances, such as estradiol or stilbestrol, cause a profound reduction in prostatic weight. However, unless the dosage is increased to the point where distinct toxicity is noted, this reduction is not as great as after castration alone (14). In the dog in whom a prostatic fistula has been created, administration of estrogens will abolish prostatic secretion (15).

Until recently all efforts to find a nonestrogenic steroid which would shrink the prostate in the rat were unsuccessful. However, in the past 6 weeks we have succeeded in causing profound prostatic atrophy in the intact rat with 19-nor ethinyl testosterone*. This compound has strong progestational properties but when tested by us has neither estrogenic nor androgenic action.

These observations naturally lead to the question: What are the mechanisms involved?

It is probable that testosterone as such is secreted by the testis and is the dominant hormone, even though an estrogen may be secreted by the testis also. In our experience, the administration of testosterone in proper amounts invariably will restore the weight of the prostate of the castrate rat to normal and renew prostatic secretion in the castrate-fistula preparation in the dog. In many ways testosterone appears to be the only hormone necessary to restore the prostate of the castrate. Before this can be said with finality, however, it will be necessary to characterize further the normal prostate, and subsequently, the testosterone treated castrate's prostate. To date, we can say that "restored" prostates are normal in terms of histology and water, nitrogen and acid phosphatase content. Other indices are being studied. It is possible that small amounts of other substances, such as estrogens and pituitary trophic hormones, act synergistically with testosterone.

The mechanism by which estrogens inhibit prostatic growth is considered by many to be one in which estrogens inhibit the pituitary trophic hormone which is responsible for stimulating the interstitial cells of the testis to produce androgen. However, Huggins and Clark (15) present evidence suggesting that estrogens will "neutralize" exogenous androgen in the castrate dog in which a fistula has been prepared. Dohan et al. (16) also present evidence for local inhibition by estrone of testosterone-induced growth of the capon's

* Dr. John R. Mote brought this compound to our attention and has furnished us with a generous supply for investigational use.

comb. Such "titration" experiments should be carried out in the absence of the pituitary, for we have recently presented evidence which suggests that pituitary luteotrophin enhances the prostate-stimulating action of exogenous androgen in the castrate rat (17). Estrogen may act to prevent release of luteotrophin. Such experiments are in progress in our laboratory.

The mechanisms by which the pituitary regulates prostatic growth may be manifold. It seems clear that the luteinizing hormone of the pituitary will restore prostatic growth in the hypophysectomized rat, and that this is accomplished by restoration of androgen production by the interstitial cells of the testis. I have already alluded to the synergistic action of pituitary luteotrophin (prolactin) and testosterone. Whether pituitary ACTH stimulates prostatic growth through production of adrenal androgens is not yet clear.

Are mechanisms such as these concerned in abnormal prostatic growth, especially benign nodular hyperplasia and cancer?

THE ABNORMAL PROSTATE

Benign Hyperplasia. Of importance in the etiology of benign nodular hyperplasia of the prostate is the observation that it has never been observed in men castrated early in life (18). Much has been written concerning the efficacy of castration for benign hyperplasia. According to Zuckerman (19), "In 1877, and again in 1882, a surgeon named Tupper performed the operation of castration, and in doing so found that he had relieved prostatic obstruction. The primary purpose of both operations had been to effect a radical cure for testicular neuralgia, and at the time Tupper was in no way moved to publish the results of his treatment." Zuckerman goes on to say that, "it was not knowledge of the gonadal control of prostatic growth that led to the next, and first deliberate, operation of castration for prostatic hypertrophy (by Professor J. William White of this city in 1893), but the fact that öophorectomy was at that time being performed for the treatment of uterine fibromyomata, a form of treatment that seems to have been well established in the seventies of last century."

In 1895 Professor White (20) expressed enthusiasm for the procedure, claiming rapid atrophy of the prostatic enlargement in over 80 per cent of 111 cases. In the following year, A. T. Cabot (21) noted "substantial or very great improvement" in over 80 per cent of 79 cases. Since 1900 castration has become obsolete as an approved method of treatment of benign hyperplasia. However, this does not necessarily indicate that the enlarged gland does not shrink when the testes are removed.

Few studies are to be found in the literature between 1900 and 1935 when Deming and his associates (22) reported two cases. They found no evidence that castration caused atrophy of the hyperplastic prostate in one month's time. That the time interval between castration and histological study of the prostate removed at operation may not have been long enough is suggested by the studies of Huggins and Stevens (23) who state: "In three men with benign prostatic hypertrophy, biopsy of the prostate was obtained at the time of castration, and 29, 86 and 91 days later. Epithelial atrophy was not present 29 days after castration but appeared plainly 86 and 91 days after the operation. . . . The evidence derived from castration on benign prostatic hypertrophy in man supports the view that the prostatic epithelium, at least, is under control of the testes." Few studies have been made since.

Although operations for removal of the enlarged prostate have been perfected to the point where it is difficult to improve upon them, it still seems desirable to search for nonoperative methods of prevention and control. If such methods are to be discovered, they may well come through study of man, for no known laboratory animal develops histologically similar hyperplasia.

Carcinoma of the Prostate. It is now over 15 years since Dr. Charles Huggins and his associates (24, 25, 26) demonstrated the profound beneficial effects of either castration or estrogen therapy, or both, in the treatment of

disseminated prostatic cancer. Based on investigations which suggested that prostatic cancer represents an overgrowth of adult prostatic epithelium and hence, like adult prostatic epithelium, should undergo atrophy when the testes are removed or estrogenic substances are given, Huggins advocated either castration or estrogen administration, or both, as treatments for the unfortunate with widespread prostatic cancer.

Since then thousands of such patients have been so treated. It is not necessary for me to go into the specific nature of the improvement, for you are all familiar with the changes which often occur following such treatment. However, it seems safe to say that improvement has been not only subjective but objective.

Shortly after the introduction of hormonal therapy, it was recognized that many patients failed to respond, or responded for only a short time, to either castration or estrogen therapy, or both. In all cases receiving such therapy, relapse appeared to be inevitable. Explanations for failure and relapse were sought. Estimation of the urinary 17-ketosteroids of such patients suggested that, in the absence of the testes, androgenic steroids were being produced by the adrenal glands, and that these steroids were responsible for failure of initial treatment and relapse (27).

In 1944 and 1945, Huggins and your speaker (28) removed both adrenals in several patients with widespread prostatic cancer who had relapsed on castration-estrogen therapy. At that time cortisone was not available in significant amounts, and without it, lethal adrenal insufficiency invariably occurred. One patient lived 116 days after removal of both adrenals. Study showed that he excreted very little steroidal material in the urine. However, he died of his cancer. Adrenalectomy for inoperable prostatic cancer was revived in 1951 by Huggins and Bergenstal (29). At that time cortisone became available, and consequently postoperative management was made much easier. Whereas no attempt will be made to review all of the cases of bilateral adrenalectomy which have been reported since then, a few fairly accurate generalizations can be made. Thus, some patients have obtained subjective relief. This has been largely in the form of relief of pain. On the other hand, objective relief has not occurred very often. There are few reports indicating improvement in the x-ray appearance of osseous metastases. Few have shown any decrease in the size and consistency of the local prostatic lesion or soft tissue metastases which could be measured. Life has not been lengthened appreciably.

A number of investigators advocate the use of cortisone in the treatment of relapse, and it is possible that cortisone, so necessary in the maintenance of the bilaterally adrenalectomized patient, may be responsible for the subjective relief following adrenalectomy. More work is necessary to establish this point.

While Huggins and his group have been studying the effects of adrenalectomy, we have been studying other means of endocrine treatment. One means has been hypophysectomy (30), the other, the creation of a venous shunt of adrenal blood (31). Both are distinctly in the experimental stage.

Hypophysectomy—There is much to implicate the pituitary in normal prostatic growth. Thus, we have shown that the pituitary hormone, prolactin, acts synergistically with testosterone to cause prostatic growth in the hypophysectomized-castrate rat (17), and it is well established that the luteinizing hormone of the pituitary stimulates the interstitial cells of the testis to produce androgen. Regarding abnormal prostatic growth, Herbert Evans and his associates (32, 33, 34, 35) have written extensively on the production of neoplasms in rats with pituitary growth hormone, and regression of a number of spontaneous tumors following hypophysectomy. Time does not permit me to review this evidence in detail.

In September 1948, we (30) performed the first hypophysectomy that we know of in the treatment of a patient with far advanced prostatic cancer who had relapsed on combined castration-estrogen therapy. The patient lived only 11 days. Clinically we were unable to estimate the completeness of removal, and an

autopsy could not be obtained. Since then, our Professor of Neurosurgery, Dr. A. Earl Walker, has attempted removal of the pituitary in five additional patients, all having disseminated prostatic cancer. One patient died on the second postoperative day. The cause of death was not determined, and an autopsy could not be obtained. Life following operation was too short to permit clinical estimation of the completeness of removal. Survival times in the other four were: 1 month and 3 days, 5 months and 10 days, 9 months and 11 days and 12 months and 23 days. All came to autopsy and all sella turcicas were sectioned. In two, clinical tests suggested complete removal, and in these two very little pituitary remained. In two, clinical tests indicated that removal was grossly incomplete, and such was found at autopsy. Both patients in whom only a small amount of pituitary remained at autopsy showed good clinical response. Neither died of his cancer. Both in whom considerable pituitary tissue was found at autopsy showed no clinical response. Both died of their cancer.

Results such as these have encouraged us, as well as others, to continue to investigate the role of the pituitary in abnormal prostatic growth.

The Adrenal Shunt—Time does not permit me to discuss in detail the rationale behind attempts to shunt venous blood from the adrenal through the liver. This has been described in detail elsewhere (31). By shunting adrenal effluent blood through the liver, we had hoped to create a situation in which adrenal insufficiency did not occur, making cortisone therapy unnecessary, but one in which the liver would exert its known function of "inactivating" androgens. It seemed logical to us that such a procedure might be beneficial to the patient with prostatic cancer who had relapsed on castration-estrogen therapy.

After much preliminary work in the dog, this procedure was carried out in 5 humans with prostatic cancer, all in relapse (36). A functioning shunt was obtained in 4 of the 5, and in these individuals adrenal insufficiency did not occur. In the one it did, and cortisone therapy was necessary. Whereas at this time few other conclusions can be drawn concerning this procedure, it seems to us that these patients are benefited as much by this, if not more so, than by bilateral adrenalectomy.

SUMMARY

This evening I have presented to you what I believe to be the consensus of opinion among urologists concerning the management of 4 diseases of the prostate gland. I have emphasized early recognition and appropriate treatment of any degree of renal insufficiency secondary to benign enlargement of the prostate. I have urged you to make rectal palpation of the prostate a part of every physical examination and to insist on biopsy of hard nodules so found. I have given you a brief resume of known factors concerned in the growth of the normal prostate gland and have told you how this knowledge has been applied to date in the treatment of benign hyperplasia and cancer of the prostate in man.

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The Aegean Cradle of Medicine[1]

By WILDER PENFIELD, O.M.[2]

THIS LECTURE is intended to honor Silas Weir Mitchell, brilliant physician and man of letters. Consideration of his career takes us back into the golden light of an earlier era when this City was playing a most important role. He was, in a sense, the latest and most versatile representative of that era. From the time of the Declaration of Independence until the end of the 19th century this golden light seemed to bathe the lives of the best people of Philadelphia. It was the light of the American sunrise. And in that light the heritage which men had brought from England was planted here in rich new soil, to ripen into the thought and manners of a new nation.

William Osler came here in 1884 on the first stage of the Medical Odyssey that was to take him, in succession, from McGill University to the University of Pennsylvania, Johns Hopkins and Oxford. He remained here 5 years during which time Weir Mitchell became one of his "dearest friends" for they had a "mutual interest in scientific medicine and literature." In Osler's farewell address, delivered to the students of the University of Pennsylvania, he referred to that institution as "the premier school of America, in this *Civitas Hippocratica*".

Yes, in truth, Philadelphia was the Hippocratic City of America. There were the intellectual curiosity and the restless versatility, softened by good manners and a liking for good talk and good living. These qualities might be thought a bequest from that statesman, scientist and Colonial gentleman, Benjamin Franklin, and no doubt to some extent they were. But there was something too in the life of this city that recalled the days of Classical Greece when Hippocrates taught his medical apprentices in the Island of Cos, far off in the Aegean Sea where Scientific Medicine was born.

The College dinner which preceded this lecture was a memorable affair. To the Greeks of Classical Times the word symposium meant a dinner to which those were asked who could discuss philosophy and the mysteries of life, a feast at which wine was diluted in accordance with the intellectual level of conversation desired. Tonight there was no dilution.

Benjamin Rush, the Philadelphia doctor who was one of the signers of the Declaration of Independence, became the most famous physician of his time and did much to shape the Philadelphia tradition of the versatile doctor. It was in 1887, at the Centennial of the founding of this College of Physicians that Mitchell, whose talents were as various even as those of Franklin, referred to that tradition in these words: "The physician has held an almost unquestioned and somewhat curious pre-eminence. He is and always has been relatively a more broadly important person here than elsewhere."

Mitchell himself was clearly the first American neurologist. His name, with that of Harvey Cushing, is inscribed in the entrance hall of the Montreal Neurological Institute with the names of founders of Neurology from other countries. And his biography, by Hyndman and Cone, is included in the Volume celebrating the Foundation of that institution.* For several decades he was also the leading psychiatrist of the United States. His work on nerve injuries and pain, his preoccupation with the nature of rattle snake venom, together with his "rest cure" in the treatment of hys-

[1] S. Weir Mitchell Oration XIV, College of Physicians of Philadelphia, 1 February 1956.

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* Neurological Biographies and Addresses. Foundation Volume of the Montreal Neurological Institute, Oxford Univ. Press, 1936.

teria and his reputation as practitioner and scholar made him famous throughout the world.

When Osler proposed him for election as foreign member of the Royal Society of London, he was chosen in preference to the great German scientist Ehrlich whose name was also in nomination. His medical practice was fashionable and lucrative. The Saturday evenings in his Philadelphia home were celebrated for good wine and good conversation. He was a sportsman. His poetry appeared in popular magazines. But he was, perhaps, best known to the American public as a writer of fiction.

The first of 14 novels appeared when he was 55 years of age. The best seller, "Hugh Wynne," swept the country's book stalls when he was 67. It must have been one of the first romances that fell into my eager hands as a boy. The best novel, in the estimation of his literary biographer Ernest Earnest (1950), was published in his 76th year and at 85 he decided to give up fiction writing since he was occupied with more urgent affairs! That was in 1914, a few months before his death.

One may wonder why he entered this field at all. Oberndorf (1952) has suggested that he was impelled to imitate the "Boston Brahmin", Oliver Wendell Holmes, who had written 3 "psychiatric novels". Whatever the initial impulse, fiction writing became for him a part of the summer's recreation. David Rein (1952) has called him a "psychiatric novelist" and it was true that material from his case histories reappeared in the novels but the abnormal characters that he had known in the consulting room played no more than minor roles there.

Since his first work of fiction appeared so late in life, I suspect that it was another evidence of that change to a more philosophical level of thinking that seems to come over many of the busiest men in our profession, with the passage of the years. Sir Charles Sherrington, forever occupied with the problems of Neurology, brought out his first volume of poems at the age of 68 and a book entitled "Man On His Nature", a study of "natural theology", at 83.

In Canada, at the Cascapedia Club, Weir Mitchell was ever the welcome guest of the Governor General, Lord Grey. His "vivid personality" and his skill with the salmon rod are still well remembered.† He dedicated a poem to the memory of William Henry Drummond, the Canadian doctor, who was also a poet of habitant life. In it he described how:

> "The humble heroes of the lumber drives,
> Love, laugh, or weep along his peopled verse,
> Blithe 'mid the pathos of their meagre lives."‡

Today, the Weir Mitchell "rest cure" is almost forgotten. Other text books have replaced his writings on neurology. Nevertheless, a pleasant sense of superiority still lingers in the hearts of Philadelphia Neurologists because of something handed down to them through Mills, Spiller, Burr, Cadwalader, Weisenberg, Frazier. Mitchell's poems are not to be found in modern anthologies and his books of fiction hide themselves on the dusty shelves of the second-hand dealer. His brilliant neurological observations are solid though forgotten stones in the structure of modern medicine and the inspiration of his life lives on in our lives.

But, after all, greatness of heart and brilliance of mind are best judged through the eyes of contemporaries. Who reads the Medical Texts of Sir William Osler today? Better remedies, described by younger men, have replaced Ehrlich's salvarsan treatment of syphilis too, and Paul Ehrlich the man, like Weir Mitchell and Osler, must be judged in a 19th century perspective.

Even the writings of so great a man as Hippocrates, writings which served as text books of medicine for more than 2,000 years have lost their practical value to the practising doctor today. On the other hand, Hippocrates'

† Reminiscences of Mrs. Robert Reford of Montreal.

‡ From the introductory poem by S. Weir Mitchell in the posthumous volume, The Poetical Works of William Henry Drummond, McClelland and Stewart, Toronto, 1926.

life and the ethics of the oath that was administered to his disciples may still guide us. We turn to the past for example, for inspiration, but not for knowledge.

Weir Mitchell shone in the golden light of the American sunrise, a brilliant physician, a scholar and a man of letters—an heroic figure which loomed, like that of a giant, in the Philadelphia perspective. His example is an inspiration to physicians everywhere and will be always. Herein lies the general virtue of memorial lectures.

And now, if I am to be loyal to the great tradition established by men like Franklin, Rush, Mitchell, Pepper, Osler, I must not close this address without taking you with me on a fresh excursion of my own, however modest.

THE DAWN OF MEDICINE IN THE AEGEAN

For two years I have been engaged in a voyage of exploration into the conditions that preceded, and ushered in, the dawn of Medicine. We have, ready to hand in the Hippocratic Writings, a clear conception of Scientific Medicine freed from superstition and prejudice, and with it the ethics that alone can make Medicine respectable. How could this have come from the mind of a single man, a practically unknown man? Surely he did not discover Medicine rising in all her beauty from the blue waters of the Aegean like Love as personified in the Greek myth of Aphrodite!

Let me set before you some of the notes that I have gathered on the background of the birth of Medicine. They are taken from the writings of others, the writings of historical, archeological and philological scholars, with such additions as a physician may make during his own travel and research.

Perhaps I might as well confess to you now that my eventual ambition is to draw a lively picture of Hippocrates and his times, taking the outline from all the history there is, and adding color and detail from every available source, not the least of which must be imagination. The result can only be called fiction, historical novel, but the picture might also present the truth, if the basic research is good and if the light of understanding does not fail.

About 2,000 years before Christ there was an invasion of the Greek peninsula and the northern islands of the Aegean Sea by Indo-Europeans, from the region of the Danube. They were called Achaeans, a rough strong people using bronze tools and weapons. They worshipped Mother Earth and Father Sky and the Sun, later to be called Hera and Zeus and Apollo. Fortunately, the first conquering wave of invaders did not go too far. They settled down and learned from the civilization to the south of them.

The second wave of invasion from the north came, about 1200 B.C., when the Dorians swept south and settled in the Peloponnesus to colonize the southern coast of Asia Minor and the southern islands of the Aegean Sea. Crete fell to them, and the Cretan civilization from which the Achaean had learned so much disappeared.

In the 9th century Homer wrote the Iliad, collecting the stories of the siege of Troy, an event which had occurred about 300 years earlier. Twice he referred to the blameless physician of Thrace whose name was Asclepius. Asclepius is better known to us by the Latin name, Aesculapius, but I shall use the Latin name only when speaking of him in his later role as the god of medicine.

The Greeks brought with them, to the siege of Troy, two physicians. Homer called them "cunning leeches". They were the sons of Asclepius. "A leech", he wrote, "is of the worth of many other men, for the cutting out of arrows and the spreading of soothing simples."

Between the 12th century B.C. when Troy fell and the 5th century when Hippocrates was born there were two lines of evolution. On the one hand the descendants of Asclepius became the true physicians. They called themselves Asclepiads (Hippocrates was one of them) and they handed down their knowledge and skill from father to son. On the other hand the Grecian story tellers gradually altered the memory of Asclepius, the blameless phy-

sician of Thessaly, and made from it the God of Medicine, creating a splendid myth.

THE WORSHIP OF AESCULAPIUS

Sometime after the 9th century he was established as the god of healing, and it has been claimed that between eighty and a hundred shrines and temples were built in different cities in his honour. Aesculapius was provided with antecedents and descendants appropriate to this rank as follows:

He was made the son of the nymph Coronis by Apollo, the beautiful sun god, and his birthplace was moved from Tricca to Epidaurus. They even raised his newly created daughters, Hygeia and Panacea, to the rank of goddesses and gave him a new son called Iaso. He was said to have been educated by the centaur Chiron who taught him, along with Achilles, how to treat the sick.

Furthermore his elevation to the status of god was explained, you remember, as follows: He became so successful, as a man in the practice of medicine, that Pluto, god of the underworld, complained to Zeus of a serious shortage of shades in Hades, whereupon the Father of the Gods destroyed Aesculapius with a thunderbolt. But this was no sooner accomplished than he relented and elevated him to the great Olympian company of the immortals.

The temples of Aesculapius were called Asclepions and in them patients were treated for all manner of disease. It was the custom in these Asclepions that sufferers would sleep in a covered colonnade called an abaton. After night-fall the priest of Aesculapius would walk among the sleepers and waken them one by one to talk with each about his complaints. The priest was followed on his rounds by large harmless earth snakes that must have increased his power of suggestion enormously. These snakes were plentiful at Epidaurus, where the most famous and one of the first of his shrines was built and the serpent served to identify him in the minds of the people with the older Dorian earth-god who had been followed by mystic snakes.

But the priest had more than the power of faith-healing at his command, for the patient could be referred to operating surgeons in the god's clinic on the following day or to the trained temple gymnasts who were skilled in the most elaborate uses of exercise, massage, baths. The most celebrated of the Asclepions were the following three: the one at Tricca, near the real birthplace of Asclepius, the one at Epidaurus where his miraculous birth was supposed to have occurred and the shrine* on the Island of Cos where Hippocrates was born.

EPIDAURUS

Let me introduce here a picture of this great classical shrine and "watering place", as it appeared to an imaginative tourist of today. Epidaurus was situated on the south shore of the Saronic Gulf across from Pyraeus and Athens. Thus it was on the Peloponnesus, and the shrine was set in the hills above the little harbour.

Mrs. Penfield and I did not go to it by water, as the ancient Greeks would probably have done. We made our modern pilgrimage in a tiny Citröen car driven by our friend, Doros Oeconomos, the Athenian neurosurgeon. We crossed the Corinthian isthmus to the Peloponnesus, passing through Corinth, once the

* It seems now quite certain that this temple, excavated by Herzog, was only built after the time of Hippocrates and one may assume that it was the fame that had come to Cos, because of the great Asclepiad and his school of medicine, that made it a suitable place to build such a shrine.

Withington (1921) points out that there was no particular antagonism between Greek physicians and the Asclepions. They carried on practice independently until the 5th century after Christ. The shrines of Aesculapius were closed then by order, and replaced by Christian shrines and dream oracles such as that of St. Cyrus and St. John at Alexandria.

Sophronius, Patriarch of Jerusalem who died in 640, was himself "healed". But from the beginning of the Christian era, sacred medicine was in open opposition to secular medicine, and physicians who suggested that methods of cure were rational rather than miraculous were punished. This serves to illustrate the tolerance so characteristic of the early Greeks.

wealthy and sinful city whose women welcomed all comers with such luxurious hospitality.

We stopped, in retrospective wonder, at the ruins of Mycenae where Agamemnon had summoned the Achaeans to a council of war before sailing away to the siege of Troy. That was when Asclepius was still a practising physician, long before he had his divine rebirth in Greek mythology.

The ruins of Epidaurus are above the sea in the hills of Argolis. We wandered through the ruins, rebuilding in fancy the beautiful temple of white marble and watching, in our imagination, the stream of men and women, rich and poor, passing through its pillars to look at the statue of Aesculapius as he sat facing the morning sun, with bearded face and kindly expression, the staff in his hand and the snake coiling up the staff.

As the people walked out of the temple again, they must have heard the humming voices of the multitude and the water splashing from the mouth of a towering statue that stood before the entrance—splashing into a basin from which many drank and stood up again, feeling strong and saying that even this would make them well.

To the left was the colonnaded abaton where the sick would sleep the night, and through the columns they could see the distant valley. Beside the temple was the surgical pavilion where wounds were dressed and small operations carried out on stone tables by the temple surgeons. The surgeons used the delicately made instruments which have been picked up there and are preserved now for inspection: curettes, scalpels, self-retaining retractors, thumb forceps.

On the other side of the temple they might look down on the sports stadium and then, turning back, might walk through the enormous gymnasium, watching the expert gymnasts at work. From there they would pass the therapeutic baths and join the throng in the great open square or enter one of the hotels of the well-to-do. From the square it was only a few minutes' stroll up the hillside to the outdoor theatre where 14,000 people could watch the drama, and listen to music and oratory.

We left the ruins and climbed the slope to this outdoor theatre, which is remarkably preserved. It is shaped like half a bowl set into the side of the hill. The aisles, that lead outward and upward, radiate in perfect symmetry from the round stage. We climbed to the topmost bank of seats while our guide remained standing on the stage. He spoke in a low voice to demonstrate the remarkable acoustics.

How often did those who sat here listen to the voice of young Hippolytus* as he lay mortally wounded on the stage below:

> "Weep for me, weep for me,
> Scarred, broken, trampled under foot.
> . . . . . .
> In vain I strove with patience
> To love and serve my neighbour:
> Now pain sets painful foot upon my body.
> Let go, hold me no longer,
> But let Death come to heal me;
> And, if you pity me, help me to die quickly!
> . . . . . .
> I am in love with the rending spear: Come cruel edge,
> Cleave my heart and lull my life asleep!"

And then the chorus in swaying robes of gray and purple, chanting:

> "Oh, for that quiet garden by the Western Sea
> Where the daughters of the Evening sing
> Under the golden apple-tree;"

The Greeks loved beauty, beauty of nature, beauty of the mind, beauty of the body. Young men rejoiced to match their naked strength against their equals and old men took pride in the exercise of their intellects. Competition was certainly a most important element in Greek life, competition of mind as well as body. Every city, large or small, had its theatre where men might weep at tragedy and roar aloud with raucous laughter at the coarsest comedy.

Take, for example, a passage from the rowdy play of Aristophanes, called Plutus. Curiously enough, this gives the best description that

* Euripides—Hippolytus, in Alcestis and other plays, translated by P. Vellacott, Penguin Books, 1953.

has come down to us of the "temple sleep". Cario, a slave, describes his night in the abaton to the wife of his master. He refers to the statues of the god Aesculapius and his son Iaso and his daughter Hygeia. Then he tells of the night as follows:

"Soon the Temple servitor
Put out the lights, and bade us fall asleep,
Nor stir, nor speak, whatever noise we heard.
So down we lay in orderly repose.
And I could catch no slumber, not one wink,
Struck by a nice tureen of broth which stood
A little distance from an old wife's head,
Whereto I marvellously longed to creep.
Then, glancing upwards, I beheld the priest
Whipping the cheese-cakes and the figs from off
The holy table; thence he coasted round
To every altar, spying from what was left.
And everything he found he consecrated
Into a sort of sack; so I, concluding
This was the right and proper thing to do,
Arose at once to tackle that tureen."

Wife:
"Unhappy man! Did you not fear the god?"

Cario:
"Indeed I did, lest he should cut in first,
Garlands and all, and capture my tureen.
For so the priest forwarned me he might do.
Then the old lady when my steps she heard
Reached out a stealthy hand; I gave a hiss,
And mouthed it gently like a sacred snake.
Back flies her hand; she draws her coverlets
More tightly round her, and, beneath them, lies
In deadly terror like a frightened cat.
Then of the broth I gobbled down a lot
Till I could eat no more, and then I stopped."

Wife:
"Did not the god approach you?"

Cario:
"Not till later.
And then I did a thing will make you laugh.
For as he neared me, by some dire mishap
My wind exploded like a thunder-clap."

Wife:
"I guess the god was awfully disgusted."

Cario:
"No, but Iaso blushed a rosy red
And Panacea turned away her head
Holding her nose: my wind's not frankincense."

It was the way of the Greeks, this mocking of things they held most dear. Perhaps the sky may seem a lovelier blue after rain and mud.

The great Socrates probably laughed at this comedy. And yet, on his last day, after he had drunk the deadly hemlock and was waiting for death to come upon him, he roused for a moment and said to his friend: "Crito, we ought to offer a cock to Asclepius. See to it, and don't forget."

A final sacrifice, a debt to be paid to Aesculapius! These were the last words of that philosopher who approached most closely by the way of reason to the Christian concept of God; the man Plato called, "the bravest and also the wisest and most upright."

From those topmost seats in the theatre at Epidaurus we could look down on the stage, the temple ruins beyond, the stadium and the rolling green slopes of the valley far below. As we climbed down the stone steps again the wind was cool and bracing. It brought with it the spicy scent of the pine forest, where the earth snakes still abound though men seem to have forgotten about the healing power of their slippery bodies. The good water no longer gushes from a god's mouth, but bubbles up still from the ground.

We drank it and ate fresh figs, talking with the wife of the guide who stood, as she talked, whirling her distaff while the snow white wool grew into twisted thread. Somehow we too felt refreshed and strong like so many pilgrims who came there long ago.

The patients who came to the shrine in old times were urged to leave behind them testimonials to the healing power of Aesculapius, and many did so. A man, who wrote that he had been cured of "paralysis and Oedema", donated a marble carving of himself which may still be seen. In the carving, he lies on the ground with head and back arched and arms and legs extended in powerful contraction. The sculpture is so good that no other diagnosis than hysteria could be made.

The cult of Aesculapius was based on superstition and on the belief that devils and gods struggle for bad and good in our bodies and in our minds. Nevertheless, it has since provided the medical profession with a sort of

mythology of their own. The rod and the coiled earth snake of the Greek god is now our cherished emblem.

Coming away from Epidaurus, we stopped to see a Greek Orthodox Church on a hill in the town of Nauplion. Here, pinned below one of the ikons, were many little testimonials of healing written on metal and on paper. The grateful messages of these testimonials were quite similar to those hung upon the walls of the Asclepion long, long ago.

Faith in our God still cures the broken heart and the troubled spirit. There can be no doubt that man will always have need of such healing, however much the ways of worship may change on the one hand and however far scientific medicine may progress on the other.

ASCLEPIADS

But all this had little to do with Medicine itself and nothing to do with Medical Science. In the fifth century before Christ it is apparent that there were two medical schools, one at Cos, an island in the Aegean Sea, and the other at Cnidus, which was about fifteen miles away on the coast of Caria, now called Asia Minor or Anatolia.

The teachers in each school, if schools they may be called, belonged to the family of Asclepiads, which claimed direct descent from Asclepius. The students were sons, or apprentices who paid stated fees to be admitted to the family and to be taught the theory and the practice of Medicine. Withington (1921), who has made an excellent study of the Asclepiadae, makes it clear that they are not to be confused with the priests of Aesculapius. The god was mentioned only once in the Hippocratic writings and that was in the Hippocratic oath.

The Asclepion was built on the island of Cos about 350 B.C. (Edelstein and Edelstein, 1945), 110 years after the birth of Hippocrates, replacing an altar to Aesculapius which had stood in the famous grove of Apollo.

All of this renders more than absurd the statements of the historian Pliny who, writing in the first century A.D., stated that Hippocrates had been able to learn and to institute "that medicine which is called 'bedside medicine' " from reading the testimonials which patients had inscribed in gratitude upon the walls of the Asclepion of Cos, and furthermore, that he had burned the temple down so that others might not know the source of this great knowledge!

The first reference to the family of Asclepiads appears in the writings of Theopompus, who stated that they came from Syrnus, a town in Caria. The coast of Caria (Asia Minor), together with the adjacent islands, was divided into three general districts: Aeolian to the north, Ionic in the mid-portion, and Doric to the south.

The six great Dorian seaport cities of the South Aegean (Cos, Cnidus, Halicarnassos, and the three cities on the island of Rhodes—Lindos, Ialysos, and Camiros) formed a Doric Hexapolis largely for the purposes of sports competitions in honor of Apollo. These games were held at Cnidus, and occasionally an outstanding athlete from one of the cities was able to bring honor to his city by winning at the Olympic Games. This is of considerable importance, for the records of the sports of these cities are much better preserved than the records of governments or of the two centers of medical teaching. The sports records throw a good deal of light on the way of life.

Although the settlements were Doric, the Hippocratic writings were in Ionic Greek like the poetry of Homer and the books of the first historian, Herodotus. Herodotus was born in Halicarnassos and was contemporary with Hippocrates. The first great philosophers were Ionic. Thales was a Milesian and Pythagoras came from the island of Samos north of Cos.

THE LIFE OF HIPPOCRATES

Next to nothing is known of the actual life of Hippocrates, although the impact of his thinking on posterity was so great. Galen, who was born in Pergamus (Caria) in 130 A.D., was a most ardent admirer of Hippocrates and made much propaganda of his teachings. But

some of the sources to which Galen had access have disappeared.

A contemporary of Galen's, Soranus, by name, a physician of Ephesus, whom Galen apparently disliked, wrote a short biography of Hippocrates drawn from such records as he could find 500 years after his death. The account states that Hippocrates was born in Cos, a descendant of Hercules and of Asclepius, the 20th. generation from the one and the 19th. from the other.

According to the Archives of Cos, the biography continues, he was born on the 18th. day of the month of Agrianus, a day long set apart by the Coans for his honor. "He left his own country for burning the library in Cnidus, if we may believe a malicious writer, Andreas, in his book of the Origin of Physick."

Obviously, this accusation is as preposterous as the tale that Pliny had told a century earlier, since it would hardly be consistent with the high character of the man as judged by other evidence, especially the Hippocratic writings. Strange gossip to have survived 500 years!

However, the story is important for it is the only historical suggestion that there were libraries in those days and that a medical one existed in Cnidus. It might well have been the private libary of the leader of the Cnidean Asclepiads. But it seems likely that there was a similar library in Cos, and that when the writings of Hippocrates were collected in Alexandria by order of Ptolemy 2nd. a century later, the collection was made up of scrolls from such libraries.

The biographer continues with the description of the great successes of Hippocrates as a physician, and how he refused the invitations of various kings to come to other countries. Finally, when Artaxerxes urged him to come to Persia, "offering him, at the same time, great rewards; he, from a regard to decency, a contempt of riches and a love of his country, refused him . . ."

He died in Thessaly, in the city of Larissa, having "taught his art, with great candour and liberality, to those who were studious of it."

Then the biographer adds the charming remark that near the monument "a flight of bees made their honey for a long time", and it is reported that children, who were anointed with the honey by their nurses, at the side of his grave, were cured of "aphtha's" or little ulcers in the mouth.

Cos is a wind-swept island in the Aegean Sea, mountainous for the most part, with pleasant foothills and valleys. It is about 30 miles in length and 3 or 4 miles in width at the widest. On the west end there is now a village called Cephalos, high on the hill above the beautiful bay of Camara. This was the site of the most ancient capital, which was called Astypalia. It was apparently from here that ships were sent to join the other Greeks when they besieged Troy under the leadership of Agamemnon.

Sometime before the fourth century B.C., the chief seaport of the island was built on the eastern end of the island at Cos Meropis on the site of the present city of Cos. Hippocrates probably left Cos soon after the outbreak of the Pelponnesian War in 431 B.C. Certain earlier scholars believed that this transfer of the capital took place after that time (Sudhoff, 1930), but later evidence indicates that the time was much earlier. Laurenzie* studied the ruins of the present city after the earthquake of 1933 and found what he considers to be a large pre-Hellenistic city there.

At the time of that earthquake, a tablet of Pentelic, or Athenian, marble was shaken out of one of the houses in the present city. The tablet, which had obviously been sent from Athens to be set up in the city's market place, bore an inscription demanding that the city should pay, as a member of the Delian League, a tribute to Athens of three talents. This bore the date when Hippocrates would have been a young man.

It is in the present city also, in a carefully guarded enclosure near the shore that looks to the eastward toward Halicarnassos, the famous plane tree of Hippocrates stands. The

* Personal communication.

Islanders maintain, and have done so for many centuries, that it was beneath this tree that Hippocrates taught his disciples. It is dwarfed as to height but has an enormous hollow trunk, 45 feet in circumference. Sturdy new trunks are growing up from its roots.

During the 400 years of Turkish occupation, it was guarded by them carefully and the branches supported by stone pillars. They built a mosque before it so that the tree now stands in front of the mosque built by the Turks and behind the Governor's Palace, built by the Italians during their brief occupation between the two world wars. All the world reveres Hippocrates, especially those whom the Greeks once called Barbarians.

I must conclude that the evidence is strongly in favour of the truth of the legendary tradition. Hippocrates the second, whom we may call Hippocrates the Great, the Father of Medicine, lived and taught here at the eastern end of the island; and doubtless his father Heracleides and his grandfather Hippocrates the First did so before him.

Many of the inscriptions found on the island of Cos by Paton and Hicks (1891) refer to Hippocrates and to members of his family. His mother, Praxithea, and his grandmother, Phainarete, seem to have come from the pleasant farming town on the south shore, half way between the ancient Astypalia and the more recent Cos Meropis. There are references, likewise, to his brother Soranus, who was also an Asclepiad.

Contemporary with Hippocrates was the great leader of the Cnidian Asclepiads, Euryphon, a physician with a special interest in the diseases of women. The Cnidian School was probably older than that of Cos. Most scholars agree that some of his writings are included with those of Hippocrates in the Corpus Hippocraticum. Euryphon was probably the author of a book called the Cnidian Sentences that was still in existence at the time of Galen, but disappeared some time after that.

Ctesias was another famous physician of Cnidus. He became court physician to the Persian king Artaxerxes and spent much of his life there. He wrote a history of Assyria and Persia in 23 volumes; a work with which Xenophon was familiar. The history unfortunately was lost and we know little of Ctesias the physician.

The writings of these physicians were probably collected in the following century after the centre of Greek culture had moved to Egypt in the wake of the conquests of Alexander the Great. There, at the new court in Alexandria, Herophilos, a physician from Cos, wrote commentaries on the doctrines of Hippocrates and discussed his terminology. There also Erasistratos of Cnidus upheld the teachings of the rival school. There, no doubt, scholars from various parts of the world copied and translated the writings of the Aegean Asclepiads and carried their copies away to various cities of Europe and Asia before the destruction of the Alexandrian Library.

It was not until the tenth century A.D. that an effort was made to collect, re-translate and edit the works then attributed to Hippocrates. In 1861, Littré finally completed a splendid translation of the Corpus Hippocraticum into French, a task to which he had given 23 years of his life. And in the first decade of the twentieth century, there appeared a scholarly English translation by the philologist, W. H. S. Jones, whose discussions and introductions added much to the text.*

There are in the Corpus Hippocraticum discussions that reflect a certain rivalry and difference of opinion between Cos and Cnidus. It contains: textbooks for physicians, textbooks for laymen, pieces of research, lectures for medical students, essays by philosophers on the fringe of medicine, and note books or scrap books. Many are unfinished and none is signed. There are no originals; all have been copied and recopied through the ages.

But in spite of all that, it is clear that certain books were written by a great man, a man who

* Professor Henry Sigerist (1934) has urged that every English speaking physician should own this work which appears in four small volumes in the Loeb Classical Library Series, entitled "Hippocrates".

stood by the bedside of many a patient looking at the face of disease until he learned to predict the outcome. He passed over those things that he could not know and suppressed the irrelevant. He swept away religious superstition and the unprovable assumptions of philosophy, to record what he could see and hear and feel. He based his reasoning on observed fact and learned to assist the body in its vital struggle against disease. He reduced fractures and he carried out operations. He established a wise regimen, taking thought for the mind as well as the body, and making a careful record of his failures, for the instruction of others.

The man who wrote the best tracts, and left the most perfect clinical case records of disease that were to appear for 2,000 years, was a genius. He saw more clearly than other men in his time. No one can bring the final proof that the name of this genius was Hippocrates, nor can it be disproven.

Plato quoted Socrates as saying that "Hippocrates of Cos, of the house of the Asclepiads" was a physician as distinguished in medicine as Phidias, greatest of Greek sculptors, in his art. Again, Plato reported a discussion which Socrates carried out with his pupil Phaedo regarding the opinion of Hippocrates, of the Asclepiad family, on a philosophical question—the relation of the soul to the body (or the universe). They did not enquire as to what other physicians might think of the matter. And Aristotle used him as a symbol of greatness a generation later: "Hippocrates", he wrote, "would be called greater, not as a man but as a physician, than a man who is superior to him in stature."

So many writings must have been lost. Who can say? They may have been superior to those that have come down to us. But these, we have, are random samples of the medical thought in Cos and Cnidus. If the great leader did not write the best of them; if, like his contemporary, Socrates, he only taught by word of mouth, he was no less great. On the whole, it seems fair to assume that the best works in the Corpus are the direct or indirect expression of the thinking of Hippocrates the Second.

Finally, listen to the voice of Hippocrates: Sometimes I shall quote directly, sometimes paraphrase with the help of Singer (1921), Elisha Bartlett (1852) or Osler (1921).

"Do not believe that the gods cause illness and madness and do not hope to bring healing and help to the sufferer by means of magic or spells or false sorceries. Know rather that we must turn to nature itself, to the observation of the body in health and disease to learn the truth.

"Men ought to know that from the brain and the brain only, arise our pleasures, joys, laughter and jests, as well as our sorrow, pains, griefs and tears. Through it, in particular, we think, see, hear and distinguish the ugly from the beautiful, the bad from the good, the pleasant from the unpleasant. . . ."

"It is the same thing which makes us mad or delirious, inspires us with dread or fear, whether by night or by day, brings sleeplessness, inopportune mistakes, aimless anxieties, absent-mindedness, and acts that are contrary to habit. These things that we suffer all come from the brain when it is not healthy. . . ."

"He who would become a good physician must have a natural disposition; instruction; favourable position for study; early tuition; love of labor; leisure."

When in doubt every physician should ask for medical consultation. "At all times he should make no effort to dazzle the patient; give no lectures for the purpose of increasing his reputation, and resist the temptation to trick out teaching with quotations from the poets; make no pretence to infallibility; have regard to personal cleanliness, use elegance without luxury and perfumes with restraint."

"Life is short, art is long, opportunity is fugitive, experience is deceptive, judgement difficult."

And now, in closing,—what shall I say? How shall I express my gratitude for this honour? How phrase my admiration for this city of Brotherly Love, this Civitas Hippo-

cratica? Some hollow but high-sounding phrase, something that would hide the depth of my real feelings? That might satisfy the common convention. A flowery wreath, perhaps, before the shining shaft of the remembrance of Weir Mitchell, physician and man of letters?

No, not that; just a final greeting and farewell to my many friends who live here. Once, I nearly came to live my life with you. What pleasanter lot could have fallen to a man, than to work with the men who made this College of Physicians famous in the City of Hippocrates?

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Medical History Essay Contest

The Section on Medical History of the College of Physicians of Philadelphia announces a prize award of $100 for the best essay on the history of medicine submitted by a student of any one of the medical schools of Philadelphia. The subject may be any aspect of medical history or the medical humanities. All essays must be received by the College of Physicians on or before October 1, 1956. The manuscripts must be typewritten, double-spaced, or written in clearly legible hand, on one side of the page, with wide margins. Students who are interested may utilize the resources of the Library of the College of Physicians or any other research or reference material desired.

Mr. Walton B. McDaniel, 2nd, Curator of Library Historical Collections, at the College of Physicians, 19 South 22nd St., Philadelphia 3, Pa., or Fred B. Rogers, M.D., Clerk of the Section on Medical History, School of Medicine, Temple University, Philadelphia 40, Pa., will assist any student in choosing a subject for study, in searching for material, or in preparing the manuscript.

The prize will be awarded at a dinner to which all students submitting an essay will be invited as guests of the Section on Medical History.

The *Transactions & Studies* will have the option of publishing the winning paper and any other entries deemed suitable.

A Challenge Met

By ELLIOTT H. MORSE*

THE COLLEGE of Physicians has received a magnificent vote of confidence from civic leaders and citizens; from Fellows of the College and other physicians; from industries in the fields of the medical sciences and from business and industry less closely affiliated but not less concerned with Philadelphia medicine; from philanthropic foundations and from neighboring institutions.

This vote of confidence was cast in gifts of time and money which allowed the College to complete a building fund campaign whose deadline was December 31, 1954. Now more than a year of remodelling and expansion has provided the College with the tools needed to extend its services more effectively to the local, national, and international community.

The Heritage. The present generation has inherited an excellent reputation achieved by the College in the past and a remarkably stout building well enough planned to permit adaptation to modern conditions. From the original founders in 1787 through the men who built the College's present home in 1908 up to the present time, the College has been favored with loyal support and wise counsel.

In 1904, Dr. Horatio C. Wood, then President of the College, visualized a building that "would suffice the needs of the College for the next fifty years; and if properly planned, at the end of that or any other period, could readily be enlarged without unnecessary expense to meet any possible growth". In view of the tremendous burgeoning of medical literature and research activity in recent decades it is miraculous that Dr. Wood's prophecy should have come so close to fulfillment.

The Challenge. The proportions of the challenge were accurately defined in January, 1948, when President J. Parsons Schaeffer appointed a committee under the chairmanship of Dr. T. Grier Miller. This committee found that in order to continue to support a first class library, the College must increase its funds to purchase publications, increase the space to house them, and increase the endowment to maintain both. The College engaged the services of an architect, Mr. Robert Rodes McGoodwin and a consulting engineer, Mr. A. Ernest D'Ambly, and plans were outlined to include both the erection of a new library stack and modernization of the present building.

Modern building costs are so high that it was immediately apparent that the Fellows would have to supplement their own resources by seeking outside assistance to modernize a facility which had been freely offered to the entire community. The first step was to tell the story of the College's needs clearly to its old friends and potential new supporters. From the beginning there was confidence that help would be forthcoming if the role of the College in medical research, both in Philadelphia and elsewhere, was thoroughly understood. The story was told and people came forward to meet a unique challenge.

The Advisors. The Fellows turned to a group of civic leaders for assistance and advice on fund raising procedures. This advisory committee was composed of Messrs. Malcolm Adam, Charles S. Cheston, J. Hamilton Cheston, Martin W. Clement, William Day, John A. Diemand, R. G. Dunlop, Albert M. Greenfield, Edward Hopkinson Jr., William F. Kurtz, P. Blair Lee, Al Paul Lefton, A. S. W. Rosenbach, Lawrence Saunders, Geoffrey S. Smith, Herbert P. Stelwagon, Leon C. Sunstein, and George E. Whitwell. Throughout the early years of the campaign particular credit must be given to the self-sacrificing efforts of the late Executive Secretary of the College, Dr. J. Harold Austin. Presidents T. G.

* Librarian, College of Physicians of Philadelphia.

Fig. 1. The Packard-Krumbhaar Medical History Alcove

Fig. 2. The New Stack Area, during Construction.

Fig. 3. The Combined Catalogue and Work Room.

Miller, R. A. Kern, and L. C. Scheffey have given and continue to give unstintingly of time and effort in providing the leadership required for the campaign and to increase College income to meet inevitably increasing maintenance and operating costs. The generous support of three philanthropic groups: the Donner Foundation of Philadelphia, the Kresge Foundation of Detroit, and the Pew Memorial Foundation, contingent upon the raising of specified amounts by the College, provided an incentive which helped materially to bring the campaign to a successful conclusion.

The Builders. With the money and plans in hand, work was begun in earnest. The College engaged the services of J. S. Cornell and Son, Inc. as builders. To Mr. Allen Cornell's personal interest must be given a large measure

of credit for translating plans into reality. The architect and the builder met regularly with the building committee under the chairmanship of Dr. J. E. Rhoads, Vice-President of the College. Subcontractors' bids were invited and received in February 1955. Shortly thereafter earth began to fly and the old building began to feel the pangs of renovation.

Museum. The Mütter Museum was given a new look with the latest development in exhibition area lighting, the luminous ceiling. Fluorescent tubes mounted above pleated plastic sheets provide an even, glareless light replacing antiquated bare-bulbed fixtures which reflected spots of light from some show cases and failed to illuminate others. Lack of exhibition space was discouraging the logical growth of this important phase of the College's educational function. The old ventilating room in the basement was allocated to the Museum to provide additional exhibition space and to replace a storage room which was lost in another part of the basement. Areas of the Museum not covered by the new luminous ceiling were also relighted.

Office of the Clerk of the College. The Clerk's, office was relighted and air conditioned.

New Library Stack. The critical need for more shelf space was one of the most compelling reasons for the College's building program. At the time of the first surveys in 1948 and 1949, the pressure of a collection that then amounted to 171,000 accessioned volumes and 324,000 unaccessioned items was bulging the walls of an area with a theoretical capacity of about 235,000 volumes. The College library's function as a medical research depository serving the entire metropolitan area had precluded the possibility of discarding any considerable portion of the library's collections. Overcrowded conditions in the stacks made the shelving and location of volumes very difficult and seriously impaired the efficiency of operation. With an ever increasing influx of essential literature reporting the results of intensive research all over the world, the problem could only become greater unless heroic measures were taken.

The new library stack has been built adjacent to the south end of the old stack. All seven floors of the old stack have been extended into this area providing shelving for an estimated 160,000 volumes. The seventh floor of this new stack building has been designated for the shelving of rare books. Ventilation and humidity control in both the old and new stacks will extend the life expectancy of the older bindings and simplify the maintenance problem of cleaning. A study carrell has been installed on each floor of the new stacks facilitating the consultation of volumes in the stacks.

The building program itself required the removal of about 20,000 volumes to temporary shelving to provide space for the installation of air ducts and an elevator shaft. The construction of a passenger elevator in the stack area was designed to speed the servicing of the seven floors of stacks.

Library Reading Rooms. Modern lighting specifications have been met in the library reading rooms by the installation of adequate ceiling illumination. This lighting freed the tables from fixed locations determined by floor receptacles and made a more efficient use of floor space possible. In the Periodicals Room, the new lights now illuminate both tables and wall shelving for the first time. Existing ventilation ducts in these rooms were extended high enough to permit their use for air conditioning at some future date.

Packard-Krumbhaar Medical History Alcove. The greater flexibility of furniture arrangement made possible by new lighting made it feasible to set aside the western end of the Periodicals Room as a reading area for the library's newly established "Rare Book and Medical History Department". Shelf space has been provided for the histories, bibliographies, and other secondary sources essential to the study of medical history. Four study tables and two lounge chairs will provide seating in this section.

Staff Work Rooms. Behind-the-scenes work in the library was formerly performed in two small, poorly lighted, and inefficiently ar-

ranged rooms that were separated by toilet facilities, coat, and supply closets. This area was thrown into a single cheerfully decorated room that has increased productivity and improved staff morale. A narrow corridor has given way to shoulder high book cases. Wall cabinets have replaced the crowded supply closet. Space has been provided on the third floor for staff toilet and rest rooms adjacent to the staff lunch room.

Photoduplication Facilities. The library's cramped Photostat Room has been replaced with a larger space which will accommodate both the Photostat machine and dryer and the Cormac contact photoduplication machine as well as improved lighting and work table space.

S. Weir Mitchell Hall. A major redecoration and relighting job was done in this famed auditorium. The dark brown side panels have been painted a light grey setting off the portraits to better advantage and relieving the somber atmosphere that formerly prevailed. The central skylight has been replaced with a luminous ceiling and special spotlights illuminate the platform. The public address system has been rehabilitated to great advantage.

Cadwalader and Thomson Halls. The first floor auditoriums benefitted by the installation of modern lighting fixtures. A new projection screen was erected in Thomson Hall and the public address system was adjusted.

Mechanical and Structural Alterations. The original steam boilers converted to oil burning equipment had survived long beyond any reasonable life-expectancy. They have been replaced with modern highly efficient boilers which will be able to handle the larger heating load of the expanded building. A new oil storage tank has taken the place of one which had developed leaks.

In order to take advantage of lower electrical rates, the standard service was replaced with a new 2300 volt supply and transformers. All of the electrical wiring in the building was replaced in conformity with the rules of the National Electrical Code.

The heating and ventilating system was designed in order that air conditioning may be added later without any major alterations. Space has been left in the boiler room for machinery and the duct-work will accommodate air cooling.

A completely new roof has been placed on the building, eliminating the "patch upon patch quiltwork" that was subject to recurring leaks. Further protection to the building was insured by the painting of the exterior and many interior areas.

A major maintenance headache was removed when the glass skylight in the upper lobby was removed in favor of an arched plaster ceiling. Recently developing structural weaknesses precluded the cleaning of this glass surface from above and increasing accumulations of industrial soot made it unsightly.

The Future. The bricks and mortar part of the 1948 survey committee's assessment of the College's needs has been met. The problem of adequate maintenance funds and endowment is receiving the most active attention of the present officers of the College. Evidence that the value of the College to the community, in its broadest sense, is increasingly recognized, gives every reason to expect that the second phase of the College's mid-century renaissance will be equally successful. With a newly refurbished and expanded building, the College of Physicians, its Fellows, officers, and staff will strive as ever to justify the continued confidence so amply demonstrated by our generous friends and benefactors.

Memoir of John Alexander (1891–1954)*

By JOHN B. FLICK, M.D.

DOCTOR JOHN ALEXANDER, an Honorary Fellow of this College, was born on February 24, 1891, in Philadelphia. He was the son of Lucien Hugh and Mazie (Just) Alexander. He was educated at the Episcopal Academy, the Chestnut Hill Academy and the University of Pennsylvania. He received the degree of Bachelor of Science in 1912, Master of Arts in 1913, Doctor of Medicine in 1916, and honorary Doctor of Science in 1940, all from the University of Pennsylvania.

Soon after graduation Dr. Alexander joined an American unit headed by Dr. Joseph A. Blake which served with the French Army in France. Later when the United States entered World War I he was commissioned in the Medical Reserve Corps of the United States Army as First Lieutenant and Captain and served in the United States and in France. His internship training was at the Hospital of the University of Pennsylvania.

Following the war Dr. Alexander studied with Leon Bérard at Lyon, France, who at that time was employing surgery in the treatment of pulmonary tuberculosis. In 1919 in recognition of Dr. Alexander's studies he received a certificate in Surgery and Anatomy from the Université de Lyon.

After returning to the United States, Dr. Alexander served for a year as assistant instructor in surgery at the University of Pennsylvania. In 1920 he was appointed to the faculty of the University of Michigan Medical School as instructor in surgery. There his advancement was rapid and in 1932 he was appointed Professor of Surgery. During the entire period at the University of Michigan he was in charge of the Section of Thoracic Surgery, Department of Surgery, in the University Hospital. In addition he was consulting thoracic surgeon to a number of hospitals and sanatoriums in the state of Michigan.

Early in his career at the University of Michigan Dr. Alexander developed tuberculosis of the spine which necessitated a prolonged period of rest, and he sought cure at Saranac Lake. While there immobilized in a body cast, he wrote a treatise on the surgery of pulmonary tuberculosis which was published in serial form in the *American Journal of Medical Sciences*. In recognition of this work, in 1925 he was awarded the quinquennial Samuel D. Gross Prize by the Philadelphia Academy of Surgery. Subsequently this material was published in book form and is the first monograph on the surgery of pulmonary tuberculosis to appear in the English language. This little book had much to do with arousing interest in the surgical treatment of pulmonary tuberculosis in this country. During the preparation of this book Dr. Alexander, because of his relative immobility, resorted to ingenious devices of his own contriving to make accessible his references and other working materials. This tenacity of purpose in overcoming physical disabilities was to continue throughout his life. Dr. Alexander returned to the University of Michigan in 1925. Soon his efforts were devoted almost exclusively to thoracic surgery. He made important contributions to the surgery of pulmonary tuberculosis, particularly in collapse therapy. Early he recognized the advantages of resection in the treatment of pulmonary tuberculosis but he did not lose sight of the value of collapse therapy in the management of the disease. His interest was by no means confined to surgery for pulmonary tuberculosis. When surgeons were groping for some means of lowering the mortality of lobectomy for bronchiectasis Dr. Alexander published the results of lo-

* Prepared, and published, at the request of the Council of the College of Physicians of Philadelphia.

bectomy by a two-stage technique with the then low mortality of 16 per cent. This operation while now obsolete played a part in the development of the surgical treatment of bronchiectasis. Dr. Alexander reported a series of resections for pulmonary metastatic tumors which demonstrated that this type of surgery was justifiable under favorable circumstances. In 1943 he successfully removed an aneurysm of the thoracic aorta. This probably was the first operation of its kind reported in the literature.

Dr. Alexander established a residency in thoracic surgery at the University of Michigan in 1928. He soon recognized the value of general surgical training in preparation for training in thoracic surgery and made this a requirement for the acceptance of residents on his service. By the time of his death he had trained seventy-nine surgeons in thoracic surgery.

In 1937 Dr. Alexander published a comprehensive book on "The Collapse Therapy of Pulmonary Tuberculosis." This was written for both the internist and the surgeon and covered the advances made in the surgical treatment of pulmonary tuberculosis in the twelve years following the publication of his first treatise.

Dr. Alexander was a member of the Founders' Group of the American Board of Surgery and the Board of Thoracic Surgery. He was president of the American Association for Thoracic Surgery in 1935, Vice-president of the National Tuberculosis Association in 1944, and president elect of the American Trudeau Society in 1946. The last named honor was relinquished because of illness. He was a member of the American Surgical Association, the Society of Clinical Surgery, the Central Surgical Society, the International Surgical Society and many other organizations.

Dr. Alexander was elected an Honorary Fellow of the College of Physicians in 1939. He was an honorary member of the Society of Thoracic Surgery of Great Britain and Ireland, Société Française de la Tuberculose, Société Belge de Chirurgie, Sociedad de Argentina de Cirujanos, Sociedad Paraguaya de Tisiologia, and the Sociedad Equatoriana de Tisiologia. He was a member of the Editorial Board of the Journal of Thoracic Surgery and other journals including the Punjab Medical Journal.

Dr. Alexander married the former Emma Ward Woolfolk in 1936. He is survived by his wife, two sisters, Mrs. William T. Campbell and Mrs. Thomas R. Piersol, Jr., and a brother, Sterling C. Alexander.

Like many other men who have contributed to our knowledge of tuberculosis Dr. Alexander himself was a sufferer from the disease. His tuberculosis was widespread involving the spine and genito-urinary tract as well as the lungs. During the latter years of his life he was burdened with a ureterostomy. His courage and above all his cheerfulness were an inspiration to all who knew him. Throughout his career as a surgeon and teacher he met physical obstacles as they arose and overcame them to accomplish the work in which he was so deeply interested.

Dr. Alexander will be remembered as much for his qualities as a great human being as for his contributions to surgery.

Memoir of George Bacon Wood (1871–1954)*

By GEORGE M. COATES, M.D.

ANOTHER DISTINGUISHED Fellow of the College of Physicians of Philadelphia has gone to his eternal reward and his many professional friends throughout our country and hosts of grateful patients mourn his passing. George Bacon Wood, M.D., died on November 2, 1954, after a long illness, in the Graduate Hospital, where he had done most of his teaching of graduate students.

George Wood came of a family long distinguished in civic and medical history. His maternal grandfather, had been the Chief Engraver of the Mint of the United States. He engraved the portrait of Benjamin Franklin for the first adhesive stamp issued by our government.

Medically the record of the Wood family is imposing and George Wood was a worthy follower of the family tradition. His great-uncle, after whom he was named, had a national reputation as a scientist; as did other medical members of his family. The senior George B. Wood, born in 1798, died March 30, 1879, after a distinguished career. He had an A.M. in 1815 (year of the Battle of Waterloo), and his M.D. in 1818, both from the University of Pennsylvania. Among many positions of honor, he was Attending Physician to the Pennsylvania Hospital; President of the College of Physicians of Philadelphia; President of the American Philosophical Society; Chairman of the Committee for the Revision of the U. S. Pharmacopeia; a member of the Board of Trustees of Girard College and of the University of Pennsylvania. He published, with Dr. Franklin Bache, the Dispensatory of the United States and was author of several widely used text books on medicine.

Dr. Horatio C. Wood, Senior, father of the subject of this Memoir, was graduated from the University of Pennsylvania with an M.D. in 1862. He was a Medical Officer of the Union Army during the Civil War, and he subsequently became, successively, Professor of Botany in 1866, Professor of Materia Medica and Therapeutics (Emeritus after 1907), and Clinical Professor of Neurology, all in the University of Pennsylvania. He was visiting Physician to the University and Philadelphia General Hospitals, as well as several others. He was President of the Pharmacopeia Convention of the United States from 1890 to 1910. He served as President of the College of Physicians of Philadelphia in 1902 and 1903, and held degrees of LL.D. from Lafayette in 1883, Yale University in 1880, and the University of Pennsylvania in 1904. He continued his interest in scientific therapeutics and the editorship of many medical journals and text books, including the editorship of the United States Dispensatory.

Horatio Charles Wood, Jr., Dr. George Wood's younger brother, was born in 1874, and obtained his M.D. from the University in 1894, (incidentally he was a classmate of the writer of this Memoir, in the Arts Department of the University). He has followed in the tradition of his great-uncle and father, in devoting his distinguished services to the teaching of and research in therapeutics. He is a Fellow of the College and is now Emeritus Professor of Therapeutics in the Medical School and Graduate School of Medicine of the University of Pennsylvania, and Professor Emeritus of Physiology and Pharmacology in the Philadelphia College of Pharmacy and Science.

Dr. George Bacon Wood, the subject of this Memoir, was the great-nephew, second son and older brother of the three Woods, whose distinguished careers have been epitomized above. He was born on April 14, 1871, in

* Read before the College of Physicians of Philadelphia, 1 February 1956. Prepared and published at the request of the Council of the College of Physicians of Philadelphia.

Philadelphia; educated at the William Penn Charter School and a school in West Philadelphia, conducted by George G. Martin, which flourished for a number of years, and was attended by many of George Wood's generation. Intending to study medicine, he matriculated in the Biology Department of the University, founded by his great-uncle, after whom he was named. He obtained his certificate of proficiency in 1890, which admitted him to the School of Medicine. He obtained his M.D. in 1894, having divided the last two years of the normal three year course. An internship in the University Hospital during 1894 to 1896 followed; succeeded immediately by the study of pathology under Professors Ort and Aschoff at the University of Goettingen, Germany, and surgery with Professor Kocher in Berne, Switzerland. These were fruitful studies during the years of 1896 and 1897. On his return home he became Clinical Assistant in Surgery in the University Hospital and in St. Joseph's Hospital in Philadelphia. It was not until 1899 that he began the study of otolaryngology, with Walter J. Freeman, who was pioneering in the study of the para nasal sinuses at the old Polyclinic and also in the Children's Hospital. Being a hard, conscientious and very intelligent worker, he soon advanced to become Otolaryngologist to St. Christopher's Hospital, the Children's Hospital, the Howard Hospital and the Philadelphia Orthopaedic Hospital. When the Phipps Institute for the Study, Prevention and Cure of Tuberculosis was established by Dr. Lawrence Flick, through the munificence of the Phipps family, Dr. Wood became one of the original staff members. He served faithfully for many years as one of a group of four Otolaryngologists, the others being Off, Fetterolf and Coates.

He became one of the leading experts on tuberculosis of the upper respiratory tract and his writings on this subject excited widespread interest throughout the country. He had a number of appointments as Consulting Otolaryngologist in various schools and hospitals. In 1921, he became Professor of Otolaryngology in the Graduate School of Medicine in the University of Pennsylvania and Laryngologist to the Graduate Hospital, to which he devoted the rest of his life, even after he became Emeritus in 1946.

Dr. Wood, very early in his career, became interested in research, probably stimulated by the family tradition, and by his studies in Germany and Switzerland. His chief studies were devoted to the histology and histopathology of the lymphoid tissue of the upper respiratory tract, especially the transmission of infection from the tonsil to the chest organs. Other research studies included the histogenesis of the tonsillar tissues, the pathology and etiology of tonsillar infection, all being subjects of great current interest. There are over seventy such titles on the list, all thoughtful and well written pieces of work, many of which were published in the Transactions of the American Laryngological Association, which is limited to 100 members, of which he became a Fellow very early in his career. He became the 60th President in 1938–39. He was elected a Fellow of the College of Physicians of Philadelphia in 1900, and was Chairman of the Section on Otolaryngology in 1921–22. He was an honorary member of Sigma Xi, was also a Fellow of the American Laryngological, Rhinological and Otological Society, the Philadelphia Pathological Society and, of course, of the County and State Societies and the American Medical Association.

An outdoors man, Dr. Wood in his younger days was a good baseball and tennis player. He was an expert oarsman and canoeist. He enjoyed a ranch life, camping with guides and big game hunting in North Dakota, Wyoming and Canada. Always fond of fishing from his early boyhood, his chief recreation after his marriage was fishing in both fresh and salt water. He tied his own flies and did them well. For years nothing was allowed to interfere with his presence at the Swiftwater Club in the Poconos at the opening of the trout fishing season. He was a fine photographer and in his later years he greatly enjoyed drawing and water color painting.

Dr. Wood was a Major in the Medical Corps, U.S. Army in the First World War, stationed at Camp Meade in charge of the Department of Otolaryngology. In World War II, he was a member of the Medical Advisory Board in the Selective Service of the U.S., from 1941 to 1947. He also gave first aid courses to the Wardens of Wynnewood, his home at that time.

He was a Life Member of the Academy of Fine Arts and the Philadelphia Zoological Society, a member of the Academy of Natural Sciences, of the Franklin Institute, Delaware Valley Ornithological Club, The Pennsylvania State Fish and Game Association and of the Delta Phi Fraternity.

George Bacon Wood was a true scientist and a splendid physician; a thoroughly competent, although conservative, surgeon, a magnificent teacher and lecturer and a wonderful companion. His departure leaves a great vacancy in the hearts of innumerable friends and patients, who were also his friends, and generations of graduate students who will profit by his wise teaching for many years to come.

Dr. Wood was deeply religious. He was a member of the Arch Street Methodist Church from his early boyhood and was connected with many of its activities. He was long a Trustee and at one time President of the Board.

He was married on October 2, 1906, to Miss Helen Foss, daughter of Bishop Cyrus D. Foss, who survives him, together with a daughter, two sons and six grandchildren.

Memoir of Howard Childs Carpenter (1878–1955)*

By JOSEPH STOKES, Jr., M.D.

DR. HOWARD C. CARPENTER who was born Dec. 16, 1878 and died April 7, 1955, was the youngest member of a distinguished group of pediatric elder statesmen—Carpenter, Gittings, Graham, Griffith, Hamill and Hand—who represented a splendid clinical school of pediatricians in Philadelphia during the early part of the twentieth century. Five of them, including Dr. Carpenter, became presidents of the American Pediatric Society and Alfred Hand was a Vice President and member of the Council. Before becoming President of that Society in 1932, Dr. Carpenter had been inducted into its secretaryship 6 years after he became a member and he was best remembered by that Society for his indefatigable labors in this position during the 14 years, 1917 to 1931, of his incumbency.

Howard Carpenter was a true slave of conscience. He lived quietly as a bachelor with a brother and sister who also never married and his every available moment was spent in considering and carrying out his duties to children and to the organizations for children which he served. His inability to carry out as fully as he wished all the preventive work for children which had seized his imagination made him extremely uncomfortable and to an extent sapped the intellectual vigor of his waning years, although he lived to his seventy-seventh year.

It was in the Department for the Prevention of Disease at the Children's Hospital of Philadelphia, the first department of its type in this country (founded in 1913)—that he found the greatest release for his tireless energy. Every effort of his latter years at the Hospital was aimed towards increasing the value of such preventive work.

His strong personal urge to help children took him into much organizational work which on occasion placed a severe tension on his overtaxed physique. In addition to the preventive work he was also Medical Director of the Hospital for many years and Associate Professor of Pediatrics in the School of Medicine, University of Pennsylvania. He was Pediatrician to the Philadelphia General Hospital, Assistant Pediatrician of the Hospital of the University of Pennsylvania, Director of the Pediatric Service, Germantown Hospital and Dispensary, Consultant to the Delaware County Hospital, and Consulting Physician to the Preston Retreat. He took particular interest in the development of graduate medical education and became Vice Dean for Pediatrics in the Graduate School of Medicine, University of Pennsylvania, and Pediatrician in charge of the Children's Department, Graduate Hospital, with titles in this Graduate School of Professor of Pediatric Hygiene and Professor of Pediatrics. He was President of the Children's Hospital Association of America (now absorbed into the American Hospital Association), President of the Children's Bureau of Philadelphia, Representative of the American Child Health Association, an active member of the Pediatric Advisory Committee of the United States Children's Bureau, and a member of a number of other local organizations. He also became a member of the College of Physicians of Philadelphia on January 11th, 1926. He was a member of Sigma Xi.

His untiring efforts in behalf of children,

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both nationally and locally, earned for him the award of a Gold Medal by the Philadelphia Pediatric Society, in 1933, for "notable services and achievement in the field of child hygiene".

Like many scions of old Philadelphia families he had a considerable interest in the history of the city as well as in its civic development and belonged to the Sons of the American Revolution, the Colonial Society of Pennsylvania and the Society of Mayflower Descendants.

In his death the College of Physicians has lost a highly able and sensitive clinician and tireless worker for child health.

College Notes

The following candidates were elected to Fellowship on the dates given:

4 January 1956

Theodore J. Berry
John W. Eiman
Joseph T. Freeman
Eugene A. Hildreth
Robert M. Hunter
William Likoff
Raymond J. McGrath
Bernard J. Miller
Domenic J. Pontarelli
John W. Raker
William A. Reishtein
John Y. Templeton, III
Abraham J. Ziserman

1 February 1956

John B. Atkinson
Martin L. Beller
Owen Belmont
Herbert J. Dietrich
Isadore N. Dubin
Benjamin A. Gouley
William A. Keffer
John N. Lindquist

7 March 1956

James B. Carty
Armando Goracci
Frederick Harbert
Robert G. Ravdin
Albert I. Rubenstone
Daniel L. Shaw, Jr.
E. Lloyd Watkins

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Direct Vision Intracardiac Surgery for Certain Congenital Malformations: Cross Circulation-Oxygenator Techniques, Problems, and Accomplishments[1]

By RICHARD L. VARCO[2], M.D.

IT IS NOW two years plus one week since the group at the University of Minnesota Hospitals first tried and applied successfully controlled cross circulation to the correction under direct vision of a ventricular septal defect. (1) This initial technique and all subsequent clinical trials have utilized the principle of a low flow rate during the entire period of caval occlusion. That concept, at sharp variance with virtually all previous thinking about, and investigative work carried out on extra-corporeal pump oxygenator systems, was derived from azygos flow data. (2) This idea was originally proposed by Andreasen (3) and independently confirmed by Cohen and associates (4) and by Berkas and his colleagues. (5)

To date 128 individuals have been operated upon at the University of Minnesota Hospitals for the correction of intracardiac lesions using either the original technique of a donor to provide well oxygenated and decarbiated blood, or one of the subsequently developed methods of: (1) An arterialized reservoir, (2) A biological oxygenator, or (3) A bubble-type plastic oxygenator. A brief description of these various methods, an examination of some of the problems indigenous to intracardiac surgery and our approach to them, and finally, certain of the experiences and the accomplishments with this series of cases, comprise the subject matter of this lecture.

I. TECHNIQUES

The Pump

Forty-five patients have been operated upon using the donor technique. In this procedure the circulatory systems of the patient and a donor are linked together. A precise, reciprocal, exchange of arterial and venous blood is effectuated using a Sigmamotor® pump. The propelling unit consists of multiple fingers, cam actuated by an electric motor. These digits impart a unidirectional movement to blood

[1] Mary Scott Newbold Lecture LXXII, College of Physicians of Philadelphia, 4 April 1956.

[2] Professor of Surgery, University of Minnesota, Minneapolis 14, Minnesota.

Spokesman for the surgical cardiovascular team at the University of Minnesota consisting of: C. W. Lillehei, Morley Cohen, Herbert E. Warden, Richard A. DeWall, Raymond C. Read, Gilbert S. Campbell, and Vincent L. Gott.

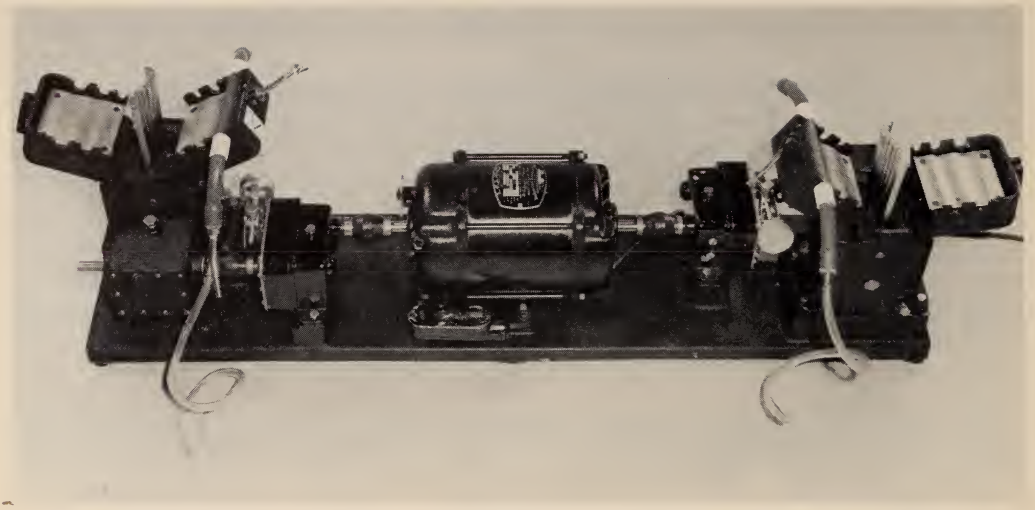

FIGURE 1

TABLE I

PRE- AND POST-OPERATIVE DATA USING BUBBLE OXYGENATOR

	Defect	Perfusion Vol. cc. per minute	Wt. in Kilo.	Control pH		End of Perfusion pH		Platelets × 1000		Plasma Hgb. mgm. %	Potassium	
				Arterial	Venous	Arterial	Venous	Control	End of Perfusion		Control	After Perfusion
M.	VSD	1300	31.5			7.34	7.27	295	146	47	5.0	3.8
G.	VSD	250	7.26		7.37	7.44	7.27			24	4.1	3.2
L.	VSD	1500	44.2	7.58	7.43	7.43	7.40	270	168	33	4.7	4.0
K.	VSD	402	8.4		7.42	7.42	7.28		370	29	3.9	3.6
J.	A. aortic stenosis	1600	48.0	7.52	7.48	7.48	7.40	334		21	4.0	3.9
W.	Tetrad	280	9.25	7.33	7.28	7.32	7.17	221	174	25	4.8	3.4

within the flexible rubber tubing. This elastic conduit is massaged against a rigid background by the undulating metal bars. A wave with a systolic and diastolic phase is thereby imparted to the blood flow. One variation of this unit is shown in Figure 1. To date this kind of machine has been remarkably free of fault within the purposes for which we have employed it. There has been no instance of intra-run mechanical breakdown throughout this entire clinical series nor in hundreds of experimental applications in the research laboratory. Despite ominous predictions of excessive damage to red cells by objectors to that form of pump principle, this dissuasive obstacle has failed to materialize. Dozens of determinations of plasma hemoglobin values secured before, during, and at the conclusion of clinical runs have always been under 100 mg. percent. In the majority of instances they have been less than half of that value. Table I reveals typical values. With the currently available interchangeable heads and appropriate size rubber tubing it is now possible to pump flows from less than 100 to 3,000 cubic centimeters per minute. Perhaps the major disturbing feature encountered in the use of existing Sigmamotor equipment is the noise factor. This remains at an undisturbing level until near capacity volumes are being shuttled about. The resolution of this annoyance is being sought and appears obtainable without

compromise of the mechanical effectiveness of this machine.

The maintenance of a balance within close tolerances between the venous afferent circuit and the arterial efferent circuit has proven no problem despite the wide range of the volumes pumped per minute. A superior intrinsic advantage of this device lies in its ability to accept fluid from a low pressure circuit and to restore it in full measure to a higher pressure circuit without any concomitant tendency to a progressive degree of imbalance. Once the two circuits have been accurately equated in terms of the amount to be handled by the pump they will remain very nearly equal unless a definite and high grade obstruction is applied differentially to either limb. We have modified the regulator on the speed changer to include a Vernier adjustment. This addition permits more delicate manipulations. Essentially, therefore, this is the unit which has served as an extra-corporeal pump for each of the four oxygenator systems (donor, reservoir, biological or bubble-type).

The Donor Technique

In order to unite reciprocally the circulatory systems of the patient and donor arterial blood is obtained via a catheter inserted through the superficial femoral artery into the aorta; simultaneously the venous blood is returned into the inferior vena cava through a cannula traversing the saphenous vein. At the conclusion of each run these catheters are withdrawn and the artery and vein repaired by lateral suture or direct end-to-end anastomosis, if the latter is required in order to avoid any serious tendency towards narrowing at the angiotomy site. In this entire series using donors there were no deaths and no serious permanent complications in any instance where the donor was cross circulated. The method has now been temporarily abandoned by our group. This action will presumably bring considerable comfort to certain more audible critics of this technique. Not withstanding the philosophical quibbling provoked by its use there remains this solid fact: For the patient it is the safest procedure yet conceived in any institution of which I am aware. It is the gold standard by which others ultimately must be judged. No other method for instance provides as rich a source for additional platelets as the donor does when his are shared with the patient despite any depletions during the operation. Other features unique to the donor-patient cross linkage technique can be readily recognized by even a casual student of this problem if he is unbiased. To cite but a few: the superior homeostatic mechanisms for temperature control, pH maintenance, and gaseous exchange. Other advantages obtainable only through this use of an appropriate donor united by cross circulation to a patient may yet find application for other diseased states.

The Reservoir System

Five people have been operated upon using a reservoir of arterialized blood in place of a donor. Undoubtedly a greater number of cases would have been managed by that device if we had not had concomitantly available other oxygenator techniques. These too, needed to be tested for their efficacy in supplanting the donor method.

The use of a reservoir containing arterialized blood was a natural evolvement from two considerations. First, it was apparent that a significant percentage of the children requiring intracardiac surgery were small. This associated growth defect indubitably was related to the intracardiac shunt for a number of children have captured a normal curve after correction of the defect. Moreover, many children while still in the infant age range, are already desperately in need of curative surgery. The second consideration was prompted by our analysis of the time required to complete the reparative procedure in the first 48 intracardiac operations. For this group the total perfusion time was less than 15 minutes in more than three-fourths of the instances.

After testing reservoir methods thoroughly in the laboratory the idea was adapted to clinical material. Arterialized blood was ob-

tained in two ways. In the first method we tried, a precisely cross-matched donor was operated upon and cannulas placed in the superficial femoral artery and the adjacent vein. Synchronously, arterialized blood was drawn into flasks containing heparin and transfusions made of corresponding amounts of citrated blood until obtaining the volume predicted as necessary for operation upon that particular infant. Under these arrangements the normal donor was able to accept and provide substantial volumes of blood without untoward event provided the injection and withdrawal were from the corresponding segments of the body. Four thousand cubic centimeters of arterialized blood were withdrawn from a donor within an hour using this plan, without significant disturbance to that individual. (6)

A simplified method which avoided these necessary cannulations and allowed the same number of donors to provide directly "arterialized" blood was also used. Many observers have described earlier the phenomenon of "arterialized" blood circulating within antecubital veins of the arm after the extremity had been immersed and maintained for at least 15 minutes in a water bath, or exposed to an otherwise appropriate heating element, at a temperature of about 45 degrees centigrade. (7 A, B, C) Under these conditions the superficial "venous" blood, particularly when it is obtained from the hand or forearm area, is uniformly saturated to around 90 percent or higher and there is a corresponding although less effective reduction in the dissolved carbon dioxide content. Myriads of arterial venous shunts open in response to the local hyperthermia and provide a ready source of "arterialized" blood which can then be drawn from the corresponding veins. This rerouteing of "arterialized" blood persists for substantial periods of time after adequate warming. The saturation can be raised additionally by having the donor voluntarily ventilate with 100% oxygen prior to withdrawal of any blood from his veins. (8) It should be emphasized that all blood drawn in this fashion should be used promptly, within the next hour or two, in order to avoid the steady drop in oxygen saturation and decline in pH which occur if this blood is maintained at room temperature. Refrigeration at 4 degrees centigrade delays effectively most of these changes. However, it should be noted that the platelet count will consistently fall to 50% or less of the original value within the first 24 hours despite this precaution of cooling the blood. Contingent again on the predicted requirements it was readily possible with the "arterialization" technique to provide a reservoir of blood for the necessary bypass interval. Bottles of this blood, carefully cross-matched, can then be readily hooked in series so that upon demand by the balanced pump circuit the calculated amount is delivered directly into the child, as if it were coming from any other acceptable donor source. The principal contribution of this technique appears to be the ready availability of all necessary equipment (other than the pump) at many centers interested in cardiac surgery. Its chief limitations are those associated with the size of the child (i.e. volume to be pumped) and the conjectured duration of the pumping time required to complete the intracardiac phase of the operation. For certain children steadily deteriorating from correctable malformations although they are still in the neo-natal period, it can provide a lifesaving expedient. Institutions with but a limited interest in the more complicated oxygenator systems may find it a particularly useful technique.

Biological Oxygenator

The sterile canine lung has been used as a biological oxygenator in thirteen cases. To insure its efficient working order it is essential to prepare and position the lung carefully. It must be in proper relationship to the equipment designed for its specific use. The details of these steps have been described. (9) The principles involved which have permitted the successful utilization of an heterologous organ, in the face of an impressive series of historical failure, are: 1. Thorough cleansing of all foreign

blood from the vascular channels after insuring that intra-vascular clotting has been prevented. 2. Interpositioning of an effective depulsating mechanism into the circuit between the pump and the pulmonary arterial side of the lung. With the systolic peaks removed and the mean pressure maintained below the colloid osmotic pressure of plasma, excessive ultrafiltration through the alveolar membrane is avoided. 3. Free flow at zero resistance, or better yet aided by slight siphonage from a short column of blood is provided for all the pulmonary venous apertures. With due regard for these precautions, flows in excess of 3,000 cc. per minute can be delivered through a lung removed from a moderate sized (15 kilograms) dog. This perfusion rate can be maintained for at least a half hour without provoking significant degrees of pulmonary edema. The arterialization and removal of carbon dioxide are excellent by this technique and at this flow rate. As occurs with all extra-corporeal oxygenator methods there is a substantial loss of heat from the patient during the interval that the blood circulates outside the patient. Caloric restoration should be made therefore both at the oyxgenator, by means of a water bath, and for the patient by hot water bottles and an electric blanket.

The Bubble Oxygenator

A bubble type oxygenator has been used for sixty-five intracardiac operations. The extensive experimental investigation involved in the development of this instrument has been described elsewhere. (10) Essentially it consists of a simple, disposable, unit which can be sterilized by autoclaving. Because of the low total cost involved (less than $5.00) it is economically practical to discard this unit after a single run and thereby eliminate the potential hazards associated with those imperfections of cleaning which are intrinsic to more costly equipment that is reused. Construction of the bubble oxygenator utilizes commercially available polyvinyl plastic hose. Throughout its entire assembly recognition is accorded the advantages of the non-wettable surface associated with plastics as contrasted with glass surfaces which have a greater tendency to interfere with the normal clotting mechanisms.

One hundred percent oxygen bubbles into venous blood where each is introduced at the base of a vertical plastic column. Dispersal of the gas is brought about either by directing it into a battery of No. 22 intravenous needles inserted through a rubber stopper or by forcing it through comparable sized pores in a nylon disc. The resulting bubbles rise and provide oxygen for the blood while simultaneously releasing from it carbon dioxide through the usual physical chemical reactions. The resulting foam cascades over into a slanted debubbling tube and a liquid state is promptly reachieved through contact with a potent, non-toxic, silicone anti-foam substance.[3] Full provision is made in this chamber for the escape of excess amounts of oxygen which assists in dispelling the liberated carbon dioxide. The reconstituted blood flows into a collecting helix. The total number of turns in this latter unit are determined by the quantity of blood required to be pumped in the specific case. These coils constitute in effect a reservoir of any desired size. The lowest aspect of this spiral connects via standard blood filters with the efferent pumping area leading to the patient's arterial circuit. Clinical use of the helix has proven the soundness of its theoretical advantages over the vertical or surface debubbler mechanisms. Any given volume of blood containing free gas must have a lower specific gravity than a comparable volume without such a globule. Therefore the natural tendency of the former unit is to rise. In the helix arrangement this provides for a steadily moving stream of heavier, bubble-free, blood which moves along the descending curvature. Free oxygen on the contrary is gently nudged away from this flow along the upper curvature until it can escape. On the contrary with many bubble type oxygenators the flow towards the collecting unit is diametric (at 180 degrees)

[3] Anti-foamA, Dow Corning Company, Midland, Michigan.

to the direction in which the oxygen and carbon dioxide must escape. An analysis of these vectors indicates that in this conflict of forces trapped gas is more likely to be dragged along. And hence unless every last globule of gas is fortuitously captured by the ultimate bubble trap, gaseous embolization inevitably will result. This diastrous phenomenon has plagued the experimental use of many instruments. To date, however, this catastrophe has not been identified in any clinical instance with our present type bubble oxygenator. In fact, for all ranges of adequate flow from the tiniest infant to the full sized adult, this unit, with appropriate adjustments in tubing for size of the patient, has proven safe, reliable, and free of the need for major alterations in order to do the job for which it was designed. Using this equipment it is possible to achieve arterial oxygen saturations in excess of 100% (including dissolved oxygen) and simultaneously carbon dioxide wash-outs greater than that normally achieved in a single passage through the lung. Despite an ever increasing experience with this oxygenator we have found that it imposes virtually no unfair or disabling strictures on the surgical team or the patient. Table No. I shows typical pH changes, platelet counts, and plasma hemoglobin values for runs on patients with representative lesions. The acidosis which can be noted is regularly encountered with all pump oxygenator techniques. It is metabolic in origin and will be considered in somewhat greater detail as one of the problems associated with intracardiac surgery. This tendency towards an acidosis can be modified favorably, to a slight degree, by creating sufficient oxygenation to reduce abnormally the blood CO_2 content.

II. THE PROBLEMS

The problems associated with intracardiac surgery fall naturally into two categories. The first of these consists of those issues arising from the complexity of the specific congenital malformation or its biological consequences. The second group deals with technical and bio-chemical posers encountered during the operative and recovery phases of patient care. To attempt an inclusive discussion of these matters would require far more manuscript space than I am entitled to by the regulations guiding publication of this lectureship. A few of the more intriguing features from both of these categories will be examined briefly, however.

Selection of Cases for Intracardiac Surgery

At least a dozen or more controversy-evoking intracardiac malformations now occupy the surgeon's attention. Inevitably, therefore, a wide spectrum of opinion will flourish, as it must if medicine is to acquire ultimately the soundest means of managing these problems. It seems pertinent in order to establish a better over-all understanding to define two separate approaches, each of which has already won supporters. One group will prefer to recommend for surgery only those persons profoundly crippled by their disease and desperately in need of relief from their circulatory ailment. By extending their indications in this direction one can predict with considerable assurance that this group's results will include a high mortality. This distraction must be balanced by all fair minded arbiters of any progress being made by the fact that just as certainly individuals will be alive and free of their disease who, but for their remedial operation, would have been lost. It is illogical and unjust to translate directly from an operative mortality rate incurred during acceptance of poor risk candidates to the wholly uncomparable situation of a similar lesion in a person who is far less ravaged by his disease. Nevertheless, discussants and consultants frequently indulge in this non sequitur.

Another group will elect to operate upon an individual with a cardiac abnormality only if the patient does not exhibit evidence of an advanced stage of his disease. Inevitably their mortality rate will be lower. Their results are certain to make converts of the proposition that this type of corrective surgery should be

more widely recommended. The public and the medical profession will be encouraged and emboldened by the frequency of these successes. Nonetheless this philosophy has telling points against it also. Obviously some individuals will succumb from those surgical losses associated with the processes of learning a new method, persons who might predictably have survived into a later era where, with greater experience, that death might likely have been avoided. Also, those shunted away because they are poor risks die prematurely without having the opportunity that corrective surgery might have provided. Too, our knowledge has not been advanced by these; by that contribution to learning from first hand surgical contacts. Future fellow sufferers will thereby not be helped in their fight for survival. This issue finds clear representation in the problem of severe pulmonary hypertension with reversal of flow whether due to a ventricular septal defect or a patent ductus arteriosus. Certain consultants favor abandoning these patients, surgically speaking, even if they have advanced only to the stage of severe pulmonary hypertension. Too frequently the surgeon's attitude smacks of self-pity and by all who think seriously about this grave problem it can scarcely be viewed as scientific. One can even argue trenchantly as to whether it is humane. This problem will not disappear merely by ignoring it, logical inference favors therefore more thought, research, and clinical enterprise rather than abandonment of the issue by default. To date a number of children have been operated upon by us despite the presence of sustained, severe, reversal of flow, to the point of generalized cyanosis at rest. To be sure all have not recovered from the operation. Of those that have survived all have not done well. There remains, though, a net gain of a few children who appear to be cured of their predisposing defect and to have recovered from that secondary disability, their pulmonary hypertension, as proven by postoperative cardiac catheterization. This unpredictableness of response, together with methods for achieving a higher long term salvage rate, seem worthy of much additional attention.

Decisions hinging about the desirability of recommending surgery, and the type of surgery to be done, in cases of tetralogy of Fallot defect are currently more difficult to make. This ambivalence in thinking has now been created by the curative surgical techniques for this anomaly. In this regard, for the past five years at our institution the recommendation for an operation in any tetralogy case has been conditioned by the imminence of a corrective procedure. We have urged a Blalock-Taussig shunt procedure only for those individuals suffering from one or more of the following conditions: 1. Profound growth failure, to an incapacitating degree. 2. Recurrent severe bouts of dyspnea associated with syncope, coma, or convulsions. 3. Heart failure. 4. A rising hematocrit or hemoglobin value, with the emphasis on the rate at which this ascent was occurring. Those children with milder degrees of involvement have been brought back periodically for check-up examination or were similarly screened at the local level by the referring physician.

From this sorely disabled group cited above, we have now begun to select our candidates for intracardiac corrective surgery. The risk to these patients has been real. It is to be emphasized, however, that the only hazard to them is likely to be the initial one. All individuals, with but a single exception, who have survived this kind of surgery appear cured. Many of them have been proven so by recatheterization. On the other hand, a recent study of our entire experience to date with the palliative shunt operation in the tetralogy of Fallot group reveals that the primary mortality is almost equalled by the late mortality. The life expectancy after a shunt operation leaves much to be desired. Assuredly, this cumulative risk must be totalled and carefully scrutinized if the physician is to view this problem in its true perspective. It is certain also that with the lapse of additional time that this attrition rate will continue to be abnormally high in all tetralogy patients submitted to a shunt pro-

cedure as contrasted with the curative operation. Confirmation of this viewpoint is found in a recent statement by Dr. Taussig to the effect that the over-all mortality so far in patients operated upon at Johns Hopkins at least five years ago, by the shunt procedure, was already 26%. In an analysis of this problem, by persons still favoring the shunt operation as the procedure of choice for patients with tetralogy of Fallot defects, it should be appreciated therefore that to the initial risk there must be added the hazards imposed by time and the greater susceptibility that these patients carry for a variety of complications of a death dealing type, plus the ultimate assumption of significant surgical mortality when the patient finally requires a curative operation to restore health or save his life.

This quandary about palliation versus cure also occupies the thinking of any surgeon or physician posed with the need to pass judgment on a child with transposition of the great vessels. At the present time some favor palliative operative procedures. It is possible, as we have reported, (11) to achieve some partial successes in this regard. Unfortunately, virtually all operative procedures, even those of the palliative type, necessitate opening the pericardium and dissecting within this serosal cavity. The effect of these efforts is to induce chemical and traumatic pericarditis with the subsequent appearance of confluent and patchy fibrous adhesions capable of obliterating the coronary pattern. This aftermath can have tragic consequences during later cardiotomy, as we were unfortunate enough to learn when a major coronary vessel was inadvertently divided because of the impossibility of discerning its exact route under an overlying plaque of dense inflammatory connective tissue. To the obvious limitations associated with but partial restoration of normal flow must be added also the fact that nearly one-half of these children with transposition have in addition an atrial or a ventricular septal defect. Restoration of a normal flow pattern can only be provided, therefore, to these tots through some form of intracardiac surgery. It seems more reasonable to include this maneuver as an essential part of the operation which also cures the transposed vascular state.

One more problem should be considered in this section, meanwhile hoping that this portion will not have become too unwieldy. The more complicated forms of atrial septal defects, the ostium primum type and the atrioventricularis communis malformation, can create a medical dilemma in our thinking about the best plan to adopt. In a given case this issue can temporarily be resolved by procrastination if the child is doing well. Often, however, this malformation, in distinction to the more benign secundum type defects of the atrial septum, has malignant capacities for inducing heart failure and severe degrees of pulmonary hypertension. The two horns on this particular problem are both sharp to the grasp. In the face of steady deterioration one can be sorely perplexed by the limitations of existing forms of medical management. On the other hand the surgical triumphs certainly have been infrequent. Our own philosophy under these circumstances has been to try to provide help through operative means. The troubled parents are informed of the rather bleak outlook (surgical and medical) as this predicament is carefully explained along with the magnitude of the problem and the likelihood for success. In one direction the prospects are predictably hopeless; while looking at it the other way one can cherish the optimistic feeling that more and more cures will surely result from a willingness to try various approaches for the management of this complex and bizarre derangement of the endocardial cushions and the septum primum of the atrium. As documentation that this is not wholly wistful thinking, one case of an atrioventricularis communis defect has been cured, as confirmed by catheterization studies postoperatively.

There remain many other problems worthy of consideration in this section. Upon this occasion it is possible to discuss only a few and

these but briefly. Pulmonary hypertension is an inevitable consequence of all ventricular septal defects if the individual survives for a sufficient period of time. A critical aspect of this problem is the rate at which this complication develops. Some infants assume an advanced status rapidly and within months of their birth already have pulmonary artery pressures equivalent to their systemic values. Other children and certain adults, definitely a minority group, acquire high pulmonary artery pressures quite slowly. The factors integral to the exact reasons for these differences remain unknown or incompletely identified. On the basis of experimental evidence (12), from clinical studies, and from autopsy examinations, it is clear that this rate of progression and the degree of pulmonary hypertension cannot be explained or predicted exclusively on the basis of volume flow, position of the lesion, its duration, nor size. All of these indubitably are factors but the most important single one identified to date appears to be the pulsatile nature of the thrust directed against the pulmonary artery. Apparently, and to varying degrees, this organ is intolerant of the abrupt systolic peaks associated with left ventricular systole as contrasted with the more gentle outflow characteristics of the right side of the heart. Our selection of the most favorable age at which to repair a ventricular septal defect must necessarily therefore be conditioned by periodic careful observations of the patient's general status, those events mirrored by the electrocardiogram, the data from an accurately performed cardiac catheterization, and a certain amount of hopeful intuitition. In this regard, once the patient has established a balanced pressure between the two circuits it can be considered as an ominous sign. In any series of individuals operated upon with this state, the likelihood is less both for immediate survival from the operative procedure and for long term complete recovery of health (a restoration of normal pulmonary artery pressures). An obligation therefore exists among all physicians responsible for the care of individuals with ventricular septal defects not to forfeit the best chances for success by undue procrastination about curative surgery after identifying the revealing signs of progressive right ventricular overloading. The validity of this contention will be developed somewhat more in the analysis of results in patients with and without severe pulmonary hypertension operated upon by our group. Meanwhile, it does not appear to be too rash a prediction that in the early future patients with proven ventricular septal defects will be considered for corrective surgery under the same general philosophy that now prevails in the minds of those faced with an operative decision about the case with a patent ductus arteriosus.

There is considerable emotional and scientific attachment to the premise that multiple malformations of the heart and great vessels should be corrected at the same time. Several of the reasons are obvious. On the other hand, the anatomical exposure most suitable for the safe management of one defect can prove quite inadequate and handicapping, in spite of its generous extension, to the soundest management of an associated lesion. For example, knowing that coarctation of the aorta and a ventricular septal defect exist, we prefer an initial correction of the coarctation through a left thoracotomy. This has been safer in our hands than attempts at doing all of the necessary surgery at one time. Another example of staged procedures for the correction of combined lesions exists for patients with total anomalous pulmonary venous return. The evidence examined to date suggests, but does not prove, that these people may have a relative mitral stenosis secondary to the substantially reduced flow made available to the left side of the heart. Certainly these patients have usually been intolerant of the abrupt complete restoration of a normal anatomical circuit. It is appreciated that with this lesion the right heart outflow is high since much of this volume is recirculated through the lungs. These facts may account for the pulmonary edema which has resulted, with death of the patient, when we have attempted

to correct completely in one stage this situation. A period of adaptation to an adjusted flow may be required in order to protect the lungs and adapt the mitral orifice. This viewpoint is considered in an expanded vein elsewhere. (13)

Technical and Biochemical Problems

As suggested earlier, involuntarily induced hypothermia complicates the use of all oxygenator techniques. This is least a factor when using a donor. For the other systems effective provision must be made to avert this drop in body temperature. In the case of babies unprotected from heat dissipation during the entire procedure, their temperature can easily fall to less than 90 degrees. The coolant action of: ether used for cleaning the skin, a bilateral thoracotomy, wet drapes and packs in association with a low humidity, cold solutions and refrigerated blood, plus masses of equipment to absorb heat; all act synergistically to depress the child's body temperature steadily. It can reach those hypothermic levels which are acknowledged to be associated with an increased irritability of the myocardium and a greater tendency towards conduction difficulties. This entire process must be anticipated and prevented by minimizing all avenues of loss and through adequate provision for supplementation of heat to the environment about the child, the equipment, and the infused liquids. Unless this is effectively accomplished, and this can be checked upon by a continuously recording indwelling rectal thermometer, the incidence of ventricular fibrillation and heart block are certain to rise.

Blood volume determinations by the existing techniques are too inaccurate to record the child's postoperative status. Quantities of blood many times the individual's total volume are handled by the pumps during each run; considerable volumes are aspirated from the operative field, or lost onto the drapes. It is vital to determine at the conclusion of the procedure the relative gain or loss in blood volume. After testing several methods, we have found that careful weighing of the child on an accurate beam type balance just before the operation begins and promptly at its conclusion gives us the most reliable analysis of this situation. For this brief period any net change is created almost totally by an alteration in the volume of circulating blood. During the postoperative period amounts lost via chest catheter drainage are replaced at the same rate. In the absence of undetected intrathoracic accumulations this technique has provided us with the most accurate means of avoiding either over or under transfusing the individual.

Metabolic acidosis is encountered after the use of all four oxygenator systems above described. It does not appear to be a direct function of the flow rate between the range of 25–50 cubic centimeters per kilogram body weight, per minute. This is true for both the clinical material and the experimental animal. The depression in pH reaches its lowest level in the cyanotic cases with tetralogy of Fallot defects since initially this group is uniformly acidotic. A partial correction of this state can be induced, and may be preferable in the more severe grade of acidosis by injecting solutions of either molar sodium lactate or 7.5% sodium bicarbonate. In the absence of heart failure, heart block, or pulmonary ventilatory problems (atelectasis, edema, excess mucus) and with good renal function, the body soon corrects this pH depression. It is pertinent to suggest that this abrupt postoperative alteration of pH from its acidotic value to the range accepted for normal persons, in the case of a tetralogy patient, may actually prejudice the child's survival. This seeming paradox of an excellent anatomical result hampering the patient's survival has been encountered in several instances to date. This baffling tragedy has been noted under just these circumstances where the child is well past infancy, has had his lesion completely corrected with the establishment of a generous outflow tract, and where no myocardial or pulmonary difficulties ensue during the postoperative period. The exact dimensions of this problem are certainly not clear at this time. Its complexities merit much careful scrutiny. Conceivably, after years of

adaptation to an abnormally acidotic environment the myocardium in the tetrad case is intolerant of sudden and sustained, albeit small, pH change. Methods capable of bringing about this environmental alteration in a more gradual fashion during the preoperative period and continued into the recovery phase are easily devised and appear worthy of trial and testing in the absence of other explicable causes for this phenomena.

Various forms of conduction difficulty and in particular, heart block, are abetted by hypothermia and acidosis. These are largely preventable or can be reversed. However, either directly by a suture or indirectly by hemorrhage and edema formation, varying degrees of atrioventricular block can be created and they are more awkward to manage effectively. The drug of choice, and in fact the only one with any real capacity for restoring a normal conduction response has been Isoprel® (iso propyl arternol hydrochloride). This is available in dilute solution for intravenous use, or in more concentrated suppository preparations. The longer this state of block exists, the more complete it is, the later its onset in the postoperative period, the graver are the implications and poorer the likelihood for eventual conversion to a regular rhythm. If it remains impossible to restore a sinus rhythm, the outlook in our experience has been poor. Coincidental with the administration of Isoprel, we have noticed electrocardiographically the appearance of improved conduction or a normal pattern although varying degrees of heart block existed previously. The need for digitoxin in any individual suffering a conduction difficulty must be most carefully balanced against this drug's propensity for provoking also that arrhythmia. In one other regard the use of digitalis preparations must be administered with particular caution. We have observed a transient but significant drop in the serum potassium level right after the run is completed, most frequently after use of the bubble type oxygenator. (See Table I.) This episode appears to be well tolerated and disappears in a few hours without untoward event unless the child has been completely digitalized. Under these circumstances the cardiotoxic action of the glucosides is enhanced and can lead to a fatality characterized by cardiac fibrillation or arrest, or both.

Certain features which might have been anticipated as sources of difficulty, but which have failed to materialize, can be listed for the reassurance they will bring to other beginners in this field. The low heparin dosage of 1.5 mg. per kilogram of body weight given directly to the patient before any cannulations, plus the 18 mg. of heparin per 500 cc. of arterialized donor blood placed either in the reservoir or infused into the patient as replacement therapy for all losses incurred while the heart is open, has proven adequate to prevent clotting during runs of up to one hour. At the conclusion of this procedure the individual is back titrated with approximately 3 mg. of protamine per kilogram of body weight. With careful attention to hemostasis from all cut surfaces throughout the preliminary dissection and as well at the conclusion of the operation before closing the chest wall, it has been possible to eliminate the item of abnormal bleeding from the operative field secondary to any heparin effect. If careful attention is given to the drawing of all transfused blood and when the construction of the extra-corporeal unit is from plastic wherever possible, then bleeding tendencies from other causes have not proven a serious problem. So far the well recognized surgical problems of fibrinogemia and fibrinolysis have not been associated with these techniques.

Air embolism, in the patient, has not been identified with use of the bubble type oxygenator and it would not be expected with the other methods. Our group recognizes that some of the otherwise unexplained deaths occurring in the postoperative period may have been provoked by this mechanism. Any proof, however, other than this inferential one is completely lacking. Expressions of this phenomenon which one would anticipate might occur simultaneously in other less vital organs, if it had occurred to the brain or the heart,

have also remained undetected. Moreover, any serious sequelae secondary to use of the low flow principle in the bubble oxygenator, or the other donor systems, have not been recognized for the liver, the kidney, the adrenal, the brain, or spinal cord. Repeated and continuing analyses of relevant data have provided no reasons for the modification or abandonment of the low flow rates during cardiac bypass procedures.

III. EXPERIENCES AND ACCOMPLISHMENTS

Lesions Operated Upon

To date the various oxygenator techniques alluded to earlier have been used in 128 cases for the following types of lesions:

- Ventricular septal defect
- Tetralogy of Fallot
- Atrio-ventricularis communis
- Ostium primum defect
- Transposition of the great vessels
- Total anomalous pulmonary venous drainage
- Aortic stenosis
- Infundibular pulmonary stenosis with an intact ventricular septum
- Mitral insufficiency
- Mitral stenosis
- Ventricular aneurysm

Approximately 90% of this experience has been acquired with the handling of ventricular septal defects and the tetralogy lesion. Considerations about these two conditions will occupy, therefore, the major portion of this phase of the presentation. Before doing that, however, glimpses at certain other conditions seem justified. One child with pure infundibular stenosis and an adult with acquired aortic stenosis appear to be cured clinically and the former has been proven so by re-catheterization. This favorable beginning is more than balanced by three consecutive failures in children with transposition of the great vessels, where curative procedures were attempted in each instance. The longest survival was less than 24 hours with the cause of death remaining somewhat obscure despite an autopsy. Reference has been made to the single success among eight children operated upon with A-V canal. Some of these fatalities are clearly ascribable to an unfamiliarity with the disturbing complexities characterizing this malformation. Some of the others undoubtedly are founded on pre-existing inadequacies in the mitral and tricuspid valvular components. This state creates an impossibility of cure by simple suture restoration striving for anatomical normalcy. For some of these cases the need for a prosthesis is hence inevitable. The simpler secundum defects, which we have operated upon only in association with an additional intracardiac malformation requiring surgery, have proven susceptible to complete closure.

The tetralogy cases have provided us with both surprise and enigma. Uniformly we have accepted as candidates for curative surgery only those culls from among the entire group with this congenital anomaly, i.e., children or young adults doing poorly on the basis of one or more of the four criteria cited earlier. Inevitably this has meant that an abnormal percentage of the group is made up of infants. Based on our experience with the shunt procedures we had anticipated a higher mortality and poorer results for this age bracket. However, six out of eight of these infants have survived. All are thriving and appear cured. This includes one child with complete atresia of the root of the pulmonary artery. For her a new outflow tract was developed through the thickness of the right ventricle and her pulmonary artery was then anastomosed to the endothelium of the right ventricle. On the contrary, the older group of children and young adults have been less tolerant of corrective surgery and a number of inexplicable deaths have resulted. To be sure, some of these bad results have been the tragic aftermath of an incomplete familiarity with all of the anatomical technical problems inherent in curative surgery. These limitations have occurred despite the fact that my associate, Dr. Lillehei and I, who have carried out the intracardiac work, have viewed during the last five years virtually every available autopsy on

this type of lesion coming to our hospital. It is impossible to emphasize too much the need for devoting innumerable hours to the painstaking study of this intricately deformed anatomy. Moreover, responsible surgeons will practice mock operations on fresh cadaver material again and again, permitting themselves only the limited exposure created by a cardiotomy. The broad range of variations which they will encounter demand this effort if they would avoid a host of fatal blunders stemming from ignorance.

The defect in the ventricular septum in the tetralogy group is regularly rimmed with muscle throughout a longer segment of its circumference than is the comparably high defect which is encountered without an associated valvular or infundibular obstruction. Moreover, it is located often behind the shelf of the hypertrophied crista supraventricularis. One works, as it were, at closing a hole under the dashboard. Time spent on cadaver specimens, trying for precise placement of an appropriate number of sutures in the friable muscular rim about this aperture, will be richly rewarding for all parties concerned when this technique must be tested in a living patient. Then the twitching, elusive, cleft, recurrently bathed in an obscuring film of blood, presents a tantalizing problem which must be dealt with delicately.

The difficulties of acquiring a working knowledge about countless features unique to a specific lesion apply almost as emphatically to ventricular septal defects. For example, one of their peculiarities lies in the extent of the septum that may be missing and the great variance that may exist in the location of the defect or defects. When located anywhere below the membranous area, the hole may be awkward to visualize because of its partial concealment behind trabeculae, hypertrophied papillary muscles, and moderator bands. Multiple ostia with perforations traversing the septum are not uncommon under these circumstances. And unless these openings are individually and completely exposed by appropriate division of the overlying tissues, the surgeon is likely to fail in his attempt at closing all stomata.

The so-called "overriding" of the aorta has been conceived of as an imposing obstacle to the successful correction of certain high ventricular septal defects. This, in the vast majority of circumstances in which the term is used, is a medical myth. Realizing how these are treasured by the believers therein, I am not so optimistic as to anticipate that my comments will correct this misimpression. It can be stated, however, categorically, that unless there is an absence of a substantial portion of the upper ventricular septum or in the presence of profound hypoplasia of the aortic outflow tract that no new substance need be added to this area enclosing the tissues about a so-called "overriding" aorta in order to correct the defect.

Severe pulmonary hypertension undoubtedly is the major remaining factor determining the mortality rate in patients with ventricular septal defects who are operated upon for a cure. With minimal degrees of hypertension the surgical risk is low and the pulmonary arteriolar changes are minimal. Microscopic examination of small pulmonary vessels from such a case may demonstrate evidence of medial hypertrophy and occasionally some intimal proliferation. However, after the intramural pulmonary artery tension has risen to a balanced state with the systemic pressure the percentage of postoperative deaths will be higher. For those that survive, the curability percentage, in terms of an ultimate restoration of a normal pulmonary blood pressure, is lower as well. In these instances a microscopic examination of the pre-capillary arteries will demonstrate many areas of medial hypertrophy and intimal proliferation to the point of luminal obliteration.

The consequences of these degrees of pulmonary arteriolar change and the hypertension that they presage are clearly reflected in the mortality associated with curative intracardiac surgery. A study of our material has indicated that when the pulmonary systolic arterial pressure is no greater than 70% of the

systemic value that the surgical risk is modest. For 23 consecutive children from age one year up (and with approximately half of them under 2 years) there have been two deaths (8.7%). In a group with the same general age characteristics but with pulmonary artery systolic pressures greater than 70% of the systemic value, there were 11 deaths in 29 cases (38%). This latter group assuredly will require our best efforts and keenest attention in order to provide a predictably more hopeful outlook for the large number of persons with ventricular septal defects who fall in this category.

Although I have been able to offer no more than a few thoughts skimmed from the numerous problems and rich opportunities created by intracardiac surgery, I do hope it has been possible to convey some of my own enthusiasms about work in this field and to arouse a sympathetic regard for it in the minds of others.

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The Lasting Influence of Sir Thomas Browne[1]

By JEREMIAH S. FINCH[2], PH.D.

WHEN your Clerk asked me to speak to you on the subject of Sir Thomas Browne, I had some misgivings lest the constant demands of a dean's office prevent my preparing a paper worthy of this distinguished College. However, recalling Sir Thomas's own complaint that he had carried on his writings despite "the fruitless importunity of Uroscopy," I resolved to be faithful to his memory. Moreover, the invitation had been extended by Dr. Fred B. Rogers, who as a student at Princeton could not choose but hear his teacher's urgings to read Sir Thomas Browne and to explore fascinating pathways in the history of medicine. Nor, could I forget the many rewarding hours spent in libraries in this city in quest of materials about Browne, in the company of the late Dr. Francis R. Packard. Who would not recall with gratitude such an experience, with such a guide? As Charles Lamb said of the Oxford antiquarian, George Dyer, "when he goes about with you to show you the halls and colleges, you think you have with you the Interpreter at the House Beautiful." (1)

In a very wise book Professor Charles Osgood of Princeton advises us to choose an author to live with: "Slowly sound his depths, year in and year out; explore your Hell and Purgatory in life—and there will be plenty of both—with him at your shoulder as Dante had Virgil at his." (2) I have been particularly fortunate in my companion, Sir Thomas Browne, because he was a human being of rare wisdom, deep insight, and warm understanding. On one occasion, Charles Lamb (who you will readily surmise is another favorite) was asked to name the person in history he would most wish to see "in his habit as he lived." It was suggested that the greatest names in English literature were Sir Isaac Newton and John Locke. "Y-yes," Lamb stammered, "the greatest names, but they were not p-p-persons, not p-p-persons." (3) Lamb then named Sir Thomas Browne as one of those he would most like to welcome in his dressing-gown and slippers, and to enage in conversation.

Lamb is but one of many of us, within and without the medical profession, who these past three hundred years have found Browne a "person," a source of wisdom, insight, and solace amid the fitful fever of much of our daily existence. I therefore venture to speak on the subject of Sir Thomas Browne with no further misgivings—indeed with enthusiasm and eagerness—for Sir Thomas belongs to us all, physicians and laymen. If he could return here tonight, he would perhaps be surprised to find himself the subject of a lecture, but he would be grateful to know that his spirit and his art have withstood time's vicissitudes and live in the minds and hearts of those who have come after him.

Tracing the "influence" of literary figures has been a favorite game of scholars and for the most part a dull business. I do not intend anything so pretentious or so forbidding. Yet, as one who does profess and call himself a humanist, I am ready to assert the importance of the influence of great men and women in our culture, and that recognition of this influence upon succeeding generations is presupposed in any optimistic view of human nature. In the words of Dr. Lloyd G. Stevenson, who addressed this section a year ago, there is "a continuum which underlies and connects individual lives." (4) If we are inclined to dismiss such connections as conjecture, we had

[1] Kate Hurd Mead Class of 1888 Lecture in Medical History, Woman's Medical College of Pennsylvania, College of Physicians of Philadelphia, 3 April 1956.

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better abandon hope of improving our present lot through education or of easing the human predicament.

There is not time tonight to retell the events of Sir Thomas Browne's life: how he returned from several years of study on the Continent to write *Religio Medici* as his confession of faith, before entering on practice in the East Anglian city of Norwich; how this little book, first published anonymously, attracted immediate attention and was read avidly in England and on the Continent in several translations; how his attack on superstition in his *Enquiries into Vulgar Errors* prepared the way for the new era of scientific activity that was heralded by the Royal Society; how his fame as a physician and author increased; and finally how in later years he composed that masterpiece of ornate prose, *Urne-Buriall*, which in power of imaginative reflection and richness of language has never been equaled. When he died in 1682 Browne had spanned "the century of genius," as Whitehead terms it, had achieved contemporary medical and lasting literary fame, and had been in close touch with many of the most exciting developments of the full years in which he had lived.

It used to be the fashion to portray Browne as a recluse, an antiquarian withdrawn from active life, but as I have tried to show elsewhere, he was nothing of the sort. His letters are filled with comments on political and scientific matters at home and abroad. For half a century he was a successful practitioner in the busy city of Norwich, "much resorted to by his patients for his admirable Skill in Physick," as an Oxford biographer put it. Browne had studied at distinguished schools on the Continent—Montpellier, Padua, and Leyden, and was at least as advanced as many of his contemporaries, and as ready to experiment as most.

But my concern in this paper is the evidence of the enduring vigor and appeal of his writings. In his own age Browne's greatest impact was on the movement towards toleration, a term then little used and less understood. At a time when the theological battle had narrowed and had become identified with the political struggle, *Religio Medici* called for patience and calm temper. He refused to shut out any large speculative truth. Small wonder that the book was seized on by controversialists on both sides. Protestants and Roman Catholics alike were intrigued by Browne's flexible, original mind. Rome placed *Religio Medici* on the *Index;* the Quakers urged Browne to join them; all the while he remained a good Anglican. Essentially, *Religio Medici* was part of an ever-broadening liberalism, marked by such men as Hooker, Chillingworth, Cudworth, and Herbert of Cherbury. How fresh and arresting must have seemed such passages as this in *Religio Medici:*

> Nor must a few differences, more remarkable in the eyes of man than perhaps in the judgment of God, excommunicate from Heaven one another; much less those Christians who are in a manner all Martyrs, maintaining their Faith in the noble way of persecution. . . . 'Tis true we all hold there is a number of Elect, and many to be saved; yet, take our Opinions together, and from the confusion thereof there will be no such thing as salvation, nor shall any one be saved. For first, the Church of Rome condemneth us, we likewise them; the Sub-reformists and Sectaries sentence the doctrine of our Church as damnable; the Atomist, or Familist, reprobates all these; and all these, them again. Thus, whilst the Mercies of God do promise us Heaven, our conceits and opinions exclude us from that place. There must be, therefore, more than one St. Peter: particular Churches and Sects usurp the gates of Heaven, and turn the key against each other; and thus we go to Heaven against each other's wills, conceits and opinions, and, with as much uncharity as ignorance, do err, I fear, in points not only of our own, but one another's salvation. (5)

Perhaps the clearest measure of the fame of *Religio Medici* are the numerous imitations which appeared. Beginning in 1645 with Herbert of Cherbury's *Religio Laici* "Religios" of every sort and description were published during Browne's lifetime, and indeed have continued to appear down to the present day. How thoughtful readers responded to Browne's book is suggested by a letter from Guy Patin to a friend, in 1644: "There are hardly any books of this sort," he wrote, "if scholars could be permitted to write freely we would discover much that is

new; the subtlety of the human spirit can be revealed in this way." (6)

Finally, of course, interest began to wane. Despite recognition of Browne on the part of such scientists as Boyle and Oldenburg, the end of the century found a different intellectual milieu in England, and *Religio Medici* had grown stale. The movement towards toleration was resolving itself into common sense and conformity, and in the cold, clear light of the approaching age of reason Browne's science was outmoded and his imaginative power ignored. Towards the end of the seventeenth century, religion and philosophy, which to Sir Thomas Browne had been one, diverged. Although the leaders of the Anglican church attempted to distinguish between what could and what could not be rationally established, the deists rejected revelation entirely, insisting on the sufficiency of a natural religion. Both the deists and their opponents were far from Browne's essential spirit. Lacking his awareness of the presence of God, they conceived a deity remote from the well-regulated universe he had created. A man who felt God's nearness to every act of daily life, who could not find enough impossibilities in religion to satisfy his faith, and who loved to lose himself in a mystery was incomprehensible to their reasoning minds, for they were inclined to attack the "mysteries" and "difficultest points" of religion with all their logic. Where Browne had written: "Surely there is a piece of Divinity in us," they tried to prove a God either *a priori* or upon the evidence of the new science. "They wished generally," says Leslie Stephen, "to preserve theology whilst getting rid of the supernatural." (7)

There were, nevertheless, those in the eighteenth century who continued to find in Browne something very much worth preserving. If space permitted, one could trace the influence of the author of *Religio Medici* in many a writer of that age, in England and on the Continent. I should like to pause briefly, however, over one in particular, Dr. Samuel Johnson, where quite unexpectedly we find a deep response.

In spite of the mass of critical material that has grown up around his name, Johnson is still something of a mystery. In his criticisms he was dogmatic and dictatorial, in his meditations humble and devout. Johnson's *Life* of Browne had been prefixed to an edition of *Christian Morals*, published in 1756, and evidently created little stir, for in 1761 the unsold sheets were republished with a new half-title and title page. Although engaged in hack-work at the time, he seems to have taken pains with the *Life*, and Boswell subsequently pronounced it "one of his best biographical performances." It apparently grew out of his labors over the *Dictionary* (1755), in the preface to which he said: "I have studiously endeavored to collect examples and authorities from the writers before the restoration, whose works I regard as *the wells of English undefiled*, as the pure sources of genuine diction . . . ."

The temperamental bond between the two was strong: the peculiar flavor of Browne's scholarship naturally appealed to a man who arose early to read *The Anatomy of Melancholy*. Both men were "souls hydroptic" for out-of-the-way knowledge, and the numerous quotations from *Vulgar Errors* in the *Dictionary* indicate that Johnson knew that work thoroughly. Browne's profession doubtless attracted Johnson, himself an amateur physician and dabbler in chemistry. Johnson warmed to Browne's piety, and since, like Johnson, Browne had in his youth been somewhat overcurious in unorthodox religious beliefs, the increasing firmness with which he adhered to the established church in his later years must have recommended him to Johnson the more strongly. Like Johnson, Browne believed in prayers for the dead. If a further bond be sought, both had attended Pembroke College, Oxford, Browne having in 1624 given an oration upon its incorporation from its former status as Broadgates Hall.

We need not linger over the biographical facts presented in the *Life*. Although Johnson used his materials to advantage, he merely

synthesized the accounts given in Whitefoot's "Minutes," Wood's *Athenae Oxonienses*, the anonymous *Life* prefixed to the *Posthumous Works* of 1712, and Kippis's *Biographia Britannica*. What is more interesting is his judgment of Browne's character, which he seems to have based on a careful and sympathetic reading of *Religio Medici*. Something about Browne's warm faith, sincere piety, and silent meditations struck a sympathetic note in the great, rough, melancholy nature of Johnson. In describing Browne's character, though he scrupulously avoids intruding his own personality upon the reader, he seems to be searching his own heart. He defends Browne's sincerity, and after several paragraphs of annihilation of those who bring false charges of atheism, he affirms:

> He may, perhaps, in the ardor of his imagination, have hazarded an expression, which a mind intent upon faults may interpret into heresy, if considered apart from the rest of his discourse; but a phrase is not to be opposed to volumes: there is scarcely a writer to be found, whose profession was not divinity, that has so frequently testified his belief of the sacred writings, has appealed to them with such unlimited submission, or mentioned them with such unvaried reverence. (8)

Through another whole paragraph he goes on, piling up instance after instance from *Religio Medici* of Browne's firm adherence to the Christian faith, the orthodox church, and, those being silent, his own conscience. Then, to clinch the argument, he concludes:

> The opinions of every man must be learned from himself: concerning his practice, it is safest to trust to the evidence of others. Where these testimonies concur, no higher degree of historical certainty can be obtained; and they apparently concur to prove, that Browne was a zealous adherent to the faith of Christ, that he lived in obedience to his laws, and died in confidence of his mercy.

This is no perfunctory defense of a man's orthodoxy. Johnson was aroused by Browne's sincerity, and angered by the bigoted arguments of the zealots who had challenged it. Under his tough hide he nourished a humble and devout faith, a faith he refused to expose to the slings and arrows of theological controversy. Although he could explain Browne's mystical experiences only as "a sudden effervescence of imagination," he found solace and strength in Browne's unshaken belief in God and the hereafter.

When Johnson comes to assess Browne's style, he assumes his dictatorial robes, and his judgments roll out with all the authority of the *Dictionary* behind them. He finds "great excellencies, and great faults":

> It is vigorous, but rugged; it is learned, but pedantick; it is deep, but obscure; it strikes, but does not please; it commands but does not allure: his tropes are harsh, and his combinations uncouth. . . .
>
> His style is, indeed, a tissue of many languages; a mixture of heterogeneous words, brought together from distant regions, with terms originally appropriated to one art, and drawn by violence into the service of another. He must, however, be confessed to have augmented our philosophical diction; and in defence of his uncommon words and expressions, we must consider, that he had uncommon sentiments, and was not content to express in many words that idea for which any language could supply a single term.

Although he lacked an ear for Browne's cadences, he was aware of his imaginative endowments:

> On whatever subject he employed his mind, there started up immediately so many images before him, that he lost one by grasping the other. His memory supplied him with so many illustrations, parallel or dependent notions, that he was always starting into collateral considerations: but the spirit and vigour of his pursuit always gives delight; and the reader follows him, without reluctance . . . .

He saw no real danger in Browne's "exotick words," for they often supplied "real deficiencies," and predicted that Browne's influence would not decline "while learning shall have any reverence among men."

As early as 1778 Vicemus Knox affirmed that Johnson "selected Sir Thomas Browne as his model of style in the composition of the Rambler," (9) but subsequent commentators show complete lack of agreement on the matter. "It is scarcely realized," wrote an anonymous reviewer in 1904, "how much Johnson based himself on Browne; how much his style was a stereotyping of Browne's. In

so far as Johnson (and the prose he bequeathed to us) was excellent, his excellence was derived from Browne. In so far as Johnson was vicious, the viciousness was his own. . . ." (10) Lytton Strachey went even further: "With the *Christian Morals* to guide him, Dr. Johnson set about the transformation of the prose of his time. He decorated; he pruned, he balanced; he hung garlands, he draped robes; and he ended by converting the Doric order of Swift into the Corinthian order of Gibbon." "The *Decline and Fall*," he ventures to say, "could not be precisely what it is, had Sir Thomas never written." (11)

On the other hand, an editor in 1848 prefaced some selections from Browne with the very different opinion that "there is a striking difference between the balanced periods of Johnson and the rush and crowding of the thoughts of Browne." (12) Here is Boswell's opinion:

> Sir Thomas Browne, whose life Johnson wrote, was remarkably fond of Anglo-Latin diction; and to his example we are to ascribe Johnson's sometimes indulging himself in this kind of phraseology. Johnson's comprehension of mind was the mould for his language. Had his conceptions been narrower, his expression would have been easier. (13)

Occasional imitations and rhetorical likenesses are, nevertheless, superficial. Like Browne's, the essence of Johnson's style escapes analysis. He could not help giving whatever he wrote a turn which stamped it as his own.

There is, however, a close relationship between the two men. Deep in Johnson's nature was a solemn awareness of his own insufficiency to fathom the problems of life and death. He seems to have realized that a capacity for deep and passionate feeling was at the heart of Browne's firm faith he so strongly admired. Here was Sir Thomas Browne, who combined within him a keen and relentless reason with a warm and glowing imagination, whose piety was so sincere that Johnson was impelled to rise to an eloquent attack on those who had questioned it. Here was a man who was content to "bring up the rear in heaven," leaving the "orchestra and noblest seats" to the great ones, who daily witnessed birth and death and continued his exacting round of duties as Norwich's leading physician with never a complaint, who could peer deep into the shades of death with never a backward glance, and who faced his own end with quiet courage. Johnson feared to give full range to his feelings in the face of the awful vastness of eternity. Such reflections sent Johnson's imagination racing into such terrifying images of punishment and oblivion—rotting in cold obstruction—that he frequently retreated into the comfortable fortress of reason and common sense.

But he was not always driven back in terror by thoughts of death. In certain of the *Rambler* essays the mood of sadness gives his style (I use the word in the broadest sense) a tone utterly unlike the sure, commanding voice of authority of the *Lives of the Poets:*

> Yet the future likewise has its limits, which the imagination dreads to approach, but which we see to be not far distant. The loss of our friends and companions impresses hourly upon us the necessity of our own departure; we know that the schemes of man are quickly at an end, that we must soon lie down in the grave with the forgotten multitudes of former ages, and shall yield our place to others, who, like us, shall be driven a while by hope or fear, about the surface of the earth, and then like us be lost in the shades of death.

This is not Johnson the law-giver; it is Johnson the devout believer, fully aware of his small part in this world and of the mystery of the world to come, relying less upon the resources of his massive intellect than upon the depth of his feelings. And as he deliberately records his thoughts he is speaking, is he not, with the tongue of Sir Thomas Browne?

> Whether to be remembered in remote times be worthy of a wise man's wish, has not yet been satisfactorily decided; and, indeed, to be long remembered, can happen to so small a number that the bulk of mankind has very little interest in the question. There is never room in the world for more than a certain quantity of measure or renown. . . .
>
> Reputation is therefore a meteor, which blazes a while and disappears for ever; and, if we except a few transcendent and invincible names, which no revolutions of opinion or length of time is able to suppress; all those that engage our thoughts, or diversify our

conversation, are at every moment hastening to obscurity, as new favourites are adopted by fashion.

It is not therefore from this world, that any ray of comfort can proceed, to cheer the gloom of the last hour. But futurity still has its prospects; there is yet happiness in reserve, which, if we transfer our attention to it, will support us in the pains of disease, and the languor of decay. This happiness we may expect with confidence, because it is out of the power of chance, and may be attained by all that sincerely desire and earnestly pursue it.

Let me place beside these a passage from *Urne-Buriall:*

Oblivion is not to be hired: the greater part must be content to be as though they had not been, to be found in the register of God, not in the record of man. Twenty seven names make up the first story, and the recorded names ever since contain not one living Century. The number of the dead long exceedeth all that shall live. The night of time far surpasseth the day, and who knows when was the Æquinox? Every houre addes unto that current Arithmetique, which scarce stands one moment. And since death must be the Lucina of life, and even Pagans could doubt whether thus to live, were to die; Since our longest Sun sets at right descensions, and makes but winter arches, and therefore it cannot be long before we lie down in darknesse, and have our light in ashes; Since the brother of death daily haunts us with dying memento's, and time that grows old it self, bids us hope no long duration: Diuturnity is a dream and folly of expectation.

Does this not suggest that Johnson has echoed Browne's splendid periods? The sentence structure is changed, but the tone and cadences remain the same. We feel the same note of sadness that we feel in Browne. In the midst of a period of reason and worldly common sense, Johnson, its very law-giver and prophet, has harked back to the inspired prose expression of another age. Something within him responded to the intimations of the brief span of man's life, the mystery of death, and the enormity of time and eternity which ignited the imagination of Sir Thomas Browne, as he mused over a handful of broken urns.

Fifty years after Johnson's death brought profound changes in the attitudes of thinking men toward writers like Sir Thomas Browne. It was part of a complex literary movement called romanticism, which can be traced in detail, but in general might be described as a re-awakening of the imaginative forces affecting literature, a rejection of certain strict rationalistic conventions, and a revival of interest in the old writers as individuals; for it was the individual human being, above all, whom the writers of the nineteenth century made the object of their attention.

It was about the turn of the century that we find Lamb and Coleridge first reading—and rejoicing—in Sir Thomas Browne. We have Lamb's own statement, in *The Two Races of Men*, that he, not Coleridge, first discovered him:

[Coleridge] will hardly allege that he knows more about that treatise than I do, who introduced it to him, and was indeed the first (of the moderns) to discover its beauties.

But Coleridge was a true devotee. Annotated copies, some containing fine criticisms in Coleridge's hand, which once were the possession of members of that famous literary circle, have come down to us. One of these is most revealing:

If I have not quite all the faith that the author of the Religio Medici possessed, I have all the inclination to it; it gives me pleasure to believe . . . . I have never read a book in which I felt a greater similarity to my own make of mind—active in inquiry, and yet with an appetite to believe—in short an affectionate visionary. (14)

I have mentioned these details because they show that the interest in Browne first arose during the early years of the Romantic period. It is less significant that the journalists of the 1820's mentioned Browne frequently than that Lamb and Coleridge were reading him with enthusiasm for his imaginative powers in the early years when their minds were best attuned to poetry. Although the influence of Browne was not clearly revealed until the *Elia* essays in 1820, Lamb first warmed to "the beautiful obliquities of the *Religio Medici*" as a young man; the quaint phrases he uttered from behind the mask of *Elia* had been learned early in life. It is significant, too, that Coleridge's "Character" of Browne, which excited so much interest in the 1820's, was written in

1802, when Coleridge was still at the height of his powers. During the decades that followed, references to Browne, imitations of his style, editions of his works, and critical essays came forth abundantly. The names of those who paid tribute reads like a roll-call of nineteenth-century English literature: Southey, Hazlitt, DeQuincey, Bulwer-Lytton, Leslie Stephen, Edward Dowden, Robert Louis Stevenson, Edmund Gosse, and Walter Pater. There were also physicians with literary interests, such as Carmichael, Norman Noore, Benjamin Ward Richardson, D'Arcy Power, and above all Osler. Yet it was Charles Lamb who most deeply absorbed Browne's mind and feelings and made them his own.

Lamb had been quoting Browne during his early years as a writer, but it was not until the mature development of his genius in the *Essays of Elia* that Browne's influence upon him became clearly apparent. His reading was "lamentably desultory and immethodical." Although he was steeped in Elizabethan drama, knew Chaucer and Sir Thomas More, and could quote Milton almost at will, he damned with faint praise many of the writers of the eighteenth century. Intimate with Coleridge and Wordsworth, he showed a real appreciation for their poetry, yet he could see nothing in Byron. Narrative irritated him. In *Mackery End* he declared:

> The fluctuations of fortune in fiction—and almost in real life—have ceased to interest, or operate but dully upon me. Out-of-the-way humours and opinions—heads with some diverting twist in them—the oddities of authorship please me most.

In *New Year's Eve* he confessed that he was "shy of novelties; new books, new faces, new years." Of the Bible he had a remarkable knowledge, probably founded at Christ's Hospital. In a conversation taken down the evening it occurred, not long before Lamb's death, Coleridge remarked:

> Watch him when alone, and you will find him with either a Bible, an old divine, or an old English poet, in such is his pleasure. (15)

"I can read the homely old versions of the Psalms in our prayer books, for an hour or two, without much sense of weariness," he wrote to Barton. (16) Leigh Hunt pronounced his library "anything but superficial," a selection made at "precious intervals from the bookstalls," with the depths of philosophy and poetry represented. Isaac Walton rested side by side with Burton, Fuller, and Browne. Montaigne, Spinoza, and Jeremy Taylor were there, as well as "Paracelsus himself," and "old Raymond Lully." (17) In his diary Crabb Robinson observed that Lamb had the "finest collection of shabby books" that he ever saw.

In the *Essays of Elia* Lamb rarely follows a given topic to its conclusion; he shifts the subject, style, and mood, and indeed seems to write whatever comes to his mind. He shrinks from the restrictions of method or outline. "I have read little," he wrote, "I have a very weak memory; am unused to any composition in which methodizing is required." Although he borrowed from the essays of Montaigne, Temple, Addison, and Johnson, he found the essay form bequeathed him weighted and bound with conventions, full of solid observations and intellectual bricklaying. For the substance which went into his essays he drew from an entirely different source—the old dramatists and prose writers, and most of all from Sir Thomas Browne.

In Browne Lamb found a man close to his own way of thinking and feeling, with the same curious irregularity of mind, and the same propensity for melancholy meditation. The two men were temperamentally akin; and when certain passages from their writings are placed side by side the resemblance is astonishing.

> In those days the sound of those midnight chimes, though it seemed to raise hilarity in all around me, never failed to bring a train of pensive imagery into my fancy.
>
> I could never hear the Ave-Mary Bell without an elevation . . . . I have wept abundantly, while my consorts, blind with opposition and prejudice, have fallen into an excess of scorn and laughter. (18)

The subtlety of Lamb's borrowings from Browne makes analysis particularly difficult. He frequently quotes:

> "At my nativity," says Sir Thomas Browne, "my ascendant was the earthly sign of Scorpius; I was born in the planetary hour of Saturn, and I think I have a piece of that leaden planet in me." One would think that he were anatomizing a tailor! Save that to the latter's occupation, methinks, a woolen planet would seem more consonant, and that he be born when the sun was in Aries.—He goes on. "I am no way facetious, nor disposed for the mirth and galliardize of company." (19)

His quotations are rarely exact. "I quote wrong," he wrote to Coleridge, "but no matter." Often he merely puts the quoted material within quotation marks without revealing the source. He had a strong sense of the significance of words, and of the value of association and allusion. Sometimes he borrows from Browne capriciously. For example, in *Witches, and Other Night Fears* he turns Browne's solemn phrase in *The Garden of Cyrus*, "can hardly with any delight raise up the ghost of a Rose," into:

> My stretch of imaginative activity can hardly, in the night season, raise up the ghost of a fish-wife.

It is not unusual to find Lamb borrowing notions from Browne without acknowledgment. In *New Year's Eve* he professes:

> I would scarce now have any of those untoward accidents and events of my life reversed. I would no more alter them than the incidents of some well-contrived novel.

This passage derives from two comments in *Religio Medici:*

> Yet for my own part I would not live over my hours past, or begin again the thread of my days . . . . Now for my life, it is a miracle of thirty years, which to relate, were not a History but a piece of Poetry, and would sound to common ears like a Fable.

In *Witches, and Other Night-Fears*, the order of the occurrence of ideas parallels a series of speculative ideas in *Religio Medici*. Lamb begins with a discussion of superstitions, digresses to childhood fear, the incidents of his boyhood, and finally arrives at a conjecture about the creativeness of the dreaming mind; a section on *Religio Medici* takes off from a discussion of miracles, shifts to a reminiscence of Browne's life—"a miracle of thirty years"—and ends in the famous passage on dreams and sleep. The resemblance between Lamb's and Browne's speculations on dreams is striking. Writes Browne:

> The degree of the soul's creativeness in sleep might furnish no whimsical criterion of the quantum of poetical faculty resident in the same soul waking.
> There is surely a neerer apprehension of any thing that delights us in our dreams, than in our waked senses. . . . It is the ligation of sense, but the liberty of reason; and our waking conceptions do not match the Fancies of our sleeps. . . . yet in one dream I can compose a whole Comedy. . . . Were my memory as faithful as my reason is then fruitful, I would never study but in my dreams.

In *That We should Rise with the Lark* (one of the "Popular Fallacies") we find a similar mental process at work:

> It is flattering to get the start of a lazy world; to conquer death by proxy in his image. But the seeds of sleep and mortality are in us; and we pay usually in strange qualms, before night falls, the penalty of the unnatural inversion. Therefore, while the busy part of mankind are fast huddling on their clothes, are already up and about their occupations, content to have swallowed their sleep by wholesale; we choose to linger a-bed, and digest our dreams. It is the very time to recombine the wandering images, which night in a confused mass presented; to snatch them from forgetfulness; to shape, and mould them . . . . We love to chew the cud of a foregone vision; to collect the scattered rays of a brighter phantasm, or act over again, with firmer nerves, the sadder nocturnal tragedies . . . . They seem to us to have as much significance as our waking concerns; or rather to import us more nearly, as more nearly we approach by years to the shadowy world . . . . We delight to anticipate death by such shadows as night affords. We are already half acquainted with ghosts. We were never very much in the world. Disappointment early struck a dark veil between us and its dazzling illusions. Our spirits showed grey before our hairs. The mighty changes of the world already appear as but the vain stuff out of which dramas are composed . . . . We are SUPERANNUATED. In this dearth of mundane satisfaction, we contract polite alliances with shadows. It is good to have friends at court. The abstracted media of dreams seem no ill introduction to that spiritual presence, upon which, in no long time, we expect to be thrown . . . .We feel

attenuated into their meagre essences, and have given the hand of half-way approach to incorporeal being.

This is an interesting example of the working of Lamb's mind; the thought is mainly associative; the images shift and fuse. Moreover, the phrases and notions from Browne are especially abundant. Indeed, the mood is so close to that in the passage on dreams in *Religio Medici* as to make citations of parallel passages unnecessary. Lamb draws heavily on Browne's imaginative resources.

There is another important point of resemblance between the two men. The passage in *New Year's Eve* expressing aversion to thoughts of death is especially rich in echoes of Browne:

I begin to count the probabilities of my duration, and to grudge at the expenditure of moments and shortest periods, . . . would fain lay my ineffectual finger upon the spoke of the great wheel. I am not content to pass away "like a weaver's shuttle." Those metaphors solace me not, nor sweeten the unpalatable draught of mortality. I care not to be carried away with the tide, that smoothly bears human life to eternity; and reluct at the inevitable course of destiny . . . . A new state of being staggers me.

Although Lamb is apparently protesting against Browne's professed willingness to die, there is no impiety implied; and when on the basis of this essay Southey accused him of "wanting a sounder religious feeling," he rose with firm indignation to defend his feelings:

If men would honestly confess their misgivings (which few men will) there are times when the strongest Christians of us, I believe, have reeled under the questionings of such staggering obscurity . . . . There are some who tremblingly reach out shaking hands to the guidance of Faith . . . . Others who stalk into the futurity on stilts. (20)

Lamb was essentially a reverent person. "The inner man, is, I well know, profoundly religious," said Coleridge, shortly before his death. (21) The warm faith revealed in Sir Thomas Browne appealed to his deepest feelings. Although Lamb could confess a reluctance to abandon life, he was no sceptic, and in many places in his writings are indications that he found a deep meaning in life and never doubted a higher goodness and truth:

We turn away from the real essences of things to hunt after their relative shadows, moral duties, whereas, if the truth of things be fairly represented, the moral duties might be safely entrusted to themselves, and moral philosophy lose the name of science. (22)

Lamb, too, "lived in divided and distinguished world," and in the world of the imagination he was close to the old Norwich physician.

This brings us within close touch of our own times, for the years that followed Lamb's death in 1832 saw a continued steady interest in Sir Thomas Browne, manifest in the appearance of many new editions of his writings. One of these, published by Ticknor and Fields in Boston in 1862, was purchased by Sir William Osler as a schoolboy. He called it "the most precious book in my library." I have examined it, along with Osler's nearly complete collection of Browne at McGill University, under the eye of Dr. W. W. Francis, whose catalogue of Osler's library is one of the monuments of medical history. It was Osler's good fortune to have fallen under the influence of a parish priest, Father Johnson, founder and warden of the Trinity College School. Johnson illustrated, as Osler put it, "that angelical conjunction (to use Cotton Mather's words) of medicine and divinity more common in the sixteenth and seventeenth centuries than in the nineteenth. An earnest student of Sir Thomas Browne, particularly of the *Religio Medici*, he often read to us extracts in illustration of the beauty of the English language, or he would entertain us with some of the author's quaint conceits, such as the man without a navel (Adam), or that woman was the rib and crooked piece of man." (23)

At the celebration of Sir Thomas Browne's tercentenary in 1905, Osler, in replying to a toast, summarized Browne's lasting influence aptly:

There are three lessons to be gathered from the life of Sir Thomas Browne, all of them of value to us to-day. First, we see in him a man who had an ideal education.

He was thoroughly versed in the classics; he lived abroad for two years, and thereby learned the hardest lesson in life, for he became denationalized as far as his intellect and his human sympathies were concerned. All places made for him but one country, and he was in England everywhere. The second important lesson we may gain is that he presents a remarkable example in the medical profession of a man who mingled the waters of science with the oil of faith. I know of no one in history who believed so implicitly and so simply in the Christian religion, and yet it is evident from his writings that he had moments of ardent scepticism. One might have wished he had been a little less credulous, and I was glad to hear Lord Avebury defend him so warmly from the charge brought against him in regard to the trial of the witches; but it must be remembered that a man must be judged by his day, by his generation, and by his contemporaries. The third lesson to be drawn is that the perfect life may be led in a very simple, quiet way. Norwich in those days was provincial and small, and yet here is a man who lived perfectly, and who lived his life successfully, not only doing good, but also being able through his industry to carry out those extensive literary works which are now our pride and our joy . . . (24)

Indeed, frequently when he touched serious subjects, Osler's mind seems to have turned to Browne by a natural process of association.

I began by speaking of the art of detachment as that rare and precious quality demanded of one who wished to take a philosophic view of the profession as a whole. In another way and in another sense this art may be still more precious. There is possible to each one of us a higher type of intellectual detachment, a sort of separation from the vegetative life of the work-a-day world—always too much with us—which may enable a man to gain a true knowledge of himself and of his relations to his fellows. Once attained, self-deception is impossible, and he may see himself even as he is seen—not always as he would like to be seen—and his own deeds and the deeds of others stand out in their true light. In such an atmosphere pity for himself is so commingled with sympathy and love for others that there is no place left for criticism or for a harsh judgement of his brother. 'But these are Thoughts of things which Thoughts but tenderly touch,' as that most liberal of men and most distinguished of general practitioners, Sir Thomas Browne, so beautifully remarks; and it may be sufficient to remind this audience, made up of practical men, *that the word of action is stronger than the word of speech.* (25)

On another occasion Osler asserted "that no book has had so enduring an influence on my life . . . it turned my thoughts toward medicine as a profession, and my most treasured copy—the second book I ever bought—has been my constant companion for thirty-one years." A reminiscence of one of Osler's former students reveals vividly the enthusiasm Osler felt for Browne.

. . . I can, and do (writes Ogden), see him perfectly as he came up to my room on the third floor of 1351 St. Catherine Street, the second or third night after I moved in. I happened to be sitting up in bed reading at physiology. He broke out at once in praise of the habit of reading in bed, but heartily disapproved the physiology—only literature, never medicine. He walked across the room standing with his back to me, his hands in his trousers' pockets, tilting up and down on his toes, and inspecting the little collection of about twenty or thirty books I had ranged on two small hanging shelves; and taking down the 'Golden Treasury' came over, sat on the foot of the bed, and half-recited, half-read, interjecting a running comment, a number of the poems. Then tossing the book to me he said: 'You'll find that much better stuff than physiology for reading in bed.' That same evening, too, he spoke of Sir Thomas Browne and the 'Religio', and probably for the first time, for I don't remember his making any reference to the subject in the lectures at the college. His enthusiasm rose as he spoke, and running downstairs he brought up his copy, pointed out and read several passages and then left me . . . .

The whole incident—W. O.'s coming up to my room, I mean—made a tremendous impression, for I had never before met a professor who struck one as so completely human, who actually liked some of the same things you did, and above all talked about them with you as an elder equal, so to speak. As you can imagine, it started my relations with him on a pleasant footing and in a pleasant direction, and naturally I have blessed my friend Rogers a thousand times for getting me into 1351. (26)

Here is the evidence and testimony of one of the greatest physicians of our time that the writings of one who had lived three hundred years before him had communicated and imparted the sense of the value of things of permanent worth. One is pleased to find, moreover, that one other congenial spirit, sealed of the tribe of Sir Thomas Browne, was also one of Osler's favorites. I mean Charles Lamb, of whom I have already spoken. Shortly before his death Osler wrote Sir Humphrey Rolleston: "I . . . have just finished vol. VII of Lucas' Lamb. How I should have liked to get drunk with Charles Lamb". (27)

If time permitted one could carry further this pleasant quest for the influences of Sir Thomas Browne on the minds and hearts of men. But as I promised at the outset, I have attempted no "survey" or careful tracing of literary currents. Nevertheless, we know that Sir Thomas's writings are still fresh and meaningful amid the noisy voices of the present day. His moving phrases find their way into the minds of many, writers and physicians alike, and his memory endures in many ways.

And so, Sir Thomas Browne was mistaken in his assertion in *Urne-Buriall* that "there is no antidote against the Opium of time," that "the inquity of oblivion blindly scattereth her poppy, and deals with the memory of men without distinction as to merit of perpetuity." We have seen how Johnson, Lamb, and Osler found in Browne deep wisdom, warm feeling, and abundant charity that came home to their hearts and remained in their minds. Who can doubt that this has borne fruit a hundred-fold? How many have not felt, in Sir Thomas's own words, "the warm gale and gentle ventilation" of his spirit, transmitted through the personalities of such men in ever-broadening dimensions? Each of the three remarkable men was in his way a true disciple. In their lives and writings the genius of Sir Thomas Browne has found its best monument.

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Dr. Jonathan Odell—Tory Satirist[1]

By FRED B. ROGERS, M.D.[2]

RABELAIS, priest and physician, characterized the healing art as "a farce played by three actors—the physician, the patient and the disease." Two centuries later, during the eighteenth century, the polite (or not so polite) art of satire reached its zenith in British clergymen and physicians who wrote trenchant comments on men, manners, and things. During this period Laurence Sterne created the querulous Dr. Slop in *Tristram Shandy*, and Tobias Smollett satirized his medical rival Mark Akenside in *The Adventures of Peregrine Pickle*. Soon thereafter, in the colony of New Jersey, Dr. Jonathan Odell, a clergyman-physician, raised his pen as satirical gladiator to defend the efforts of George the Third to suppress the American Revolution. A friend, and later an adversary of Benjamin Franklin, Odell's relationship with Franklin illustrates the vagaries of political strife. Today, when the right to free speech is a dynamic topic for discussion, the life and writings of Jonathan Odell provide interesting food for thought to each of us.

Dr. Jonathan Odell, an early graduate of Princeton College and grandson of its first president, has been described as "the most powerful and most unrelenting of the Tory satirists." A stormy petrel defending the Crown, he ridiculed the cause of independence and its leaders in this country. Partly through force of circumstances, Odell became the personification of the grim, scathing, Revolutionary-hating Loyalist who was determined to wipe out the Revolutionary movement in the colonies. Although he is depicted by literary critics as a vituperative, detestable poet and writer, it is evident that Dr. Odell was clever and courageous. His efforts to defeat the Patriot cause which he hated so bitterly were not limited to writing alone. Odell was at various times a physician, clergyman, scholar, translator, political writer, spy, and able Colonial secretary. And he employed all these talents to the utmost in fighting the attempt of the Colonies to obtain their freedom from British rule. When that attempt succeeded, Odell was forced into exile, first in England and then in the northern wilderness of Canada, where he became a prominent official in the Province of New Brunswick. Here he ended his days—a proud, bitter member of a political party that had been defeated, but not conquered or convinced.

Jonathan Odell was born at Newark, N. J., on September 25, 1737, of stern Puritan ancestry. His father, John Odell, had moved to New Jersey five years earlier from Fairfield, Connecticut; his mother, Temperance, was the daughter of the Rev. Jonathan Dickinson, first president of the College of New Jersey (now Princeton University). Young Odell was graduated from the College of New Jersey in 1754—at the age of seventeen. Five years later, in 1759, he received the master of arts degree at Princeton. Although educated as a physician, no record is now available of his medical training or degree. While serving as a surgeon in the British army, stationed in the West Indies, Odell left the service in 1763 and went to England to prepare for the ministry.

During his stay in England, Odell displayed the poetic talent that later made him famous and bitterly hated by many of his fellow Americans. Several poems remain from this period, including "A Welcome Home to the Twenty-third Regiment after the Peace of 1763", and "On Pope's Garden at Twickenham, 1765". Before taking orders, Odell taught for two

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years as an assistant in the Kingston Academy of James Elphinston who recommended him highly as a scholar. Other warm endorsements came from the clergy of Kensington, and from Benjamin Franklin, the Colonial agent in London, who recommended him to the Society for the Propagation of the Gospel in Foreign Parts and the Governor of New Jersey as missionary to the Church at Burlington.

Odell was made a deacon on December 21, 1766 in the Chapel Royal at St. James' Palace, and was ordained priest by the Bishop of London in January, 1767. In the same year he returned to America where he was inducted on July 26 as rector of St. Ann's (now St. Mary's) Church in Burlington by Governor William Franklin, son of Benjamin and last royal governor of New Jersey.

During his nine year ministry at Burlington, Dr. Odell also served the nearby St. Andrew's Church in Mount Holly, N. J., and St. James' Church across the Delaware River in Bristol, Pennsylvania. In 1771, Odell wrote that he had returned to "the practice of physick, for which profession I was originally educated." In the next year, on May 6, 1772, he married Anne, the daughter of Isaac De Cou of Burlington. Their three children, born at Burlington, included two daughters and a son, William Franklin Odell, godson of his father's patron, the royal governor.

A competent scientist of his time, Dr. Odell was elected a member of the "American Society held at Philadelphia for Promoting Useful Knowledge" on February 26, 1768. Shortly afterward, on January 6, 1769, this group joined with the American Philosophical Society of 1743 to form "The American Philosophical Society, held at Philadelphia for Promoting Useful Knowledge"—the present august organization. It is of interest that Benjamin Franklin and his son William were members of the two component societies before and after their merger in 1769. Jonathan Odell's name also appears among the list of members printed at the end of the first volume of the Society's *Transactions* in 1771.

In connection with the American Philosophical Society, Odell's ability as a translator proved valuable for scientific purposes. While abroad, Benjamin Franklin had become interested in the European method of breeding and managing silk-worms. He soon proposed a scheme to introduce the culture of silk into Pennsylvania and the adjacent colonies. Franklin sent several French agricultural treatises on this subject to Dr. Cadwalader Evans of Philadelphia, who "put (them) into the hands of an ingenious member of the American Philosophical Society residing at Burlington, requesting a translation of them." These texts, "Directions for the Breeding and Management of Silk-Worms", by the Abbé Boissier de Sauvages and Samuel Pullien, "translated and epitomized by J. Odell", were printed at Philadelphia in 1770. Appended to this publication, which was sponsored by the American Philosophical Society, was a list of Colonial officials and citizens together with their financial subscriptions in this venture. Odell's prominence in learned gatherings and his friendship with the Franklins, Dr. John Morgan, John Ewing, and other notables is recorded in letters surviving from this period.

Jonathan Odell became a valued member of The Medical Society of New Jersey, the first provincial society of medical men in this country which had been organized at New Brunswick on July 23, 1766. (The contemporary link between medicine and divinity is apparent from the fact that six clergymen, including the first president, were numbered among the thirty-six members of The Medical Society of New Jersey during its first decade.) The proceedings of the Society's meeting at Princeton on November 8, 1774 record that:

> The Rev. Dr. Odell presented himself a candidate for admission into this Society, who being well-known by many of the Society as a regular practitioner, and being well recommended, he was, without the usual mode of examination, admitted unanimously a member, and took his seat accordingly.

At the same meeting, Dr. Odell chaired a committee appointed to obtain a charter of incorporation for the Society—a matter finally not accomplished because of the outbreak of the Revolution. It is of interest that the two

other physicians serving with Odell on this committee, Drs. William Burnet, the Society's second president, and John Cochran, its third president, later became the Surgeons-General of the Eastern and Middle Departments of George Washington's army.

The American Revolution divided the medical profession. Most doctors were rebels, a few, like Odell, were Loyalists. New Jersey became the cockpit of the Revolution, sandwiched between the rebel capitol in Philadelphia and the Tory stronghold in New York. Jonathan Odell, though an ardent Loyalist, won the affection of his patients and parishioners, a fact that comforted him when his uncompromising loyalism made him a proscribed man. Although forced to take refuge behind the British lines during the war, he was granted his salary in absentia by the vestry of his church at Burlington who also cared for his family until they joined him in exile. Writing from London as late as July 1784, Odell still considered himself the rector of St. Mary's Church at Burlington.

An Anglican clergyman obliged to allegiance to the King, Odell remained passive during the period of political controversy before the Revolution. With the outbreak of war, however, he became a strong partisan on the side of the Crown. Summoned before the Burlington Committee of Safety in October 1775, because of sentiments expressed in letters to England concerning the Continental Congress, Odell subsequently stirred the rebels to wrath by his *Birthday Ode*, written for the King's birthday, June 4, 1776, and sung with much drinking of wine by a group of British soliders (captured at St. John's and Chambly by General Montgomery) who were prisoners at the time in Burlington. (This *Birthday Ode* beginning, "O'er Britannia's Happy Land", is said later to have suggested the words of Joseph Hopkinson's *Hail Columbia.*) The echoes of this song rang through the colony to the irritation of the patriots:

> Long as sun and moon endure
> Britain's throne shall stand secure,
> And great George's royal line
> There in splendid honour shine.
> Ever sacred be to mirth
> The day that gave our monarch birth.

On July 20, 1776, the Provincial Congress of New Jersey directed that Jonathan Odell, "a person suspected of being inimical to American liberty", be placed on parole and confined to a radius of eight miles from Burlington court house on the east side of the Delaware. Also he must not carry on political correspondence or furnish provisions or information to the British.

Until December 11, 1776, Dr. Odell remained peacefully in Burlington. Upon the arrival on that day of Count Donop, for whose winter quarters Burlington had been selected by the British commander, Odell went out as an interpreter with some of his neighbors, met the Hessian leader, and unquestionably spared the town insult and pillage. But the appearance of American gunboats on the river and retreat of the Hessians, was the signal for a chase with the rector as quarry. Hunted by a body of armed men, Odell was compelled to flee, leaving his wife and three young children behind. For several days he remained concealed in Governor Franklin's former house on the Burlington river front, where, in a secret room under the care of the witty Quakeress, Margaret Morris, he evaded the search parties of New Jersey militia. The pastor-physican hid himself in a tiny room, "like a thief, in an augur hole", until the 18th of December, when his hostess recorded in her journal, "Our refugee gone off today out of reach of gondolas and Tory hunters." Dr. Odell fled first to New York and later Philadelphia, remaining inside the British lines during the war. On October 3, 1778 the grand jury of Burlington County brought in an inquisition against him for treason, and in the following year confiscated his property at Burlington.

After arrival in New York, Odell was active, not only as Chaplain to a regiment of Pennsylvania Loyalists, but also as an informant concerning Colonial affairs and translator of French and Spanish papers. Recommended to Sir Henry Clinton by William Franklin as an able writer, Odell plunged into the boiling sea of satire in 1778. His Royalist propaganda, framed upon the classic models of Dryden and Pope and the venomous lines of John Churchill,

was published in the company of Joseph Stansbury, a Tory from Philadelphia. Of this pair, Odell was the more stern and vituperative writer. Deserving the title of "Toryissimus", he goaded the American patriots to fury with his stinging comments. The fighting cock on his family coat of arms was no idle ornament.

Employing tetrameter couplets as a brisk vehicle for his "acrid rhyme", Parson Odell used a loaded lash on the leaders of the American revolt. (In this contest he was opposed by his fellow Jerseyman, Philip Freneau, a formidable literary opponent who dealt out his fierce democracy on the side of the Colonists. Joseph Stansbury, in contrast, "a writer of festive political songs" and playful satire, may be compared with Francis Hopkinson, the cultured Patriot wit.) In a series of violent personal attacks, Odell's ink blotted out the good name of all on whom it dripped. Franklin, Washington, Jefferson and a host of others were depicted as shallow creatures, bereft of reason, void of honor, the scum of the revolutionary pot; whereas Clinton, Gage, and other Britishers became the holy instruments in the hand of God to cleanse the land of corruption. Odell characterized the Revolution as an "insane phrensy, produced by the wicked few in administering to their victims this potion of political necromancy—this hideous hell-broth made up of lies, sophistries, ambitions, hatreds, hallucinations". Under the signature, 'Brittanicus', Odell produced political essays lampooning continental currency; later he was press censor and wrote theatrical entertainment for British troops during their occupation of Philadelphia in 1778.

Odell's most vicious attacks are concentrated in four satires written late in 1779: *The Word of Congress*, *The Congratulation*, *The Feu de Joie*, and *The American Times*. Their author was careful in his workmanship and organized his materials with an eye to climax. Published in James Rivington's *Royal Gazette* and other newspapers in New York, Odell's lines proved their author to be a good hater and political reactionary.

Parson Odell early singled out Benjamin Franklin, his former friend, for special invective aimed at the latter's democratic sentiments. (Franklin was no more immune to slanderous assaults and false accusations than any of his contemporaries or successors in American politics.) In 1776 there appeared this "Inscription for Dr. Franklin's Smoke-Consuming Stove in the Form of an Urn", an epitaph in verse reliably ascribed to Jonathan Odell:

> Like Newton, sublimely he soared
> To a limit before unattained,
> New regions of Science explored,
> And the palm of philosophy gained,
> With a spark that he caught from the skies,
> He displayed an unparalleled wonder,
> And we saw with delighted surprise
> That his rod could protect us from thunder.
>
> Oh! had he been wise to pursue
> The path for his talent designed,
> What a tribute of praise had been due
> To the teacher and friend of mankind.
> But to court political fame
> Was in him a degrading ambition,
> A spark that from Lucifer came,
> And kindled the flame of Sedition.
>
> Let candor then write on his Urn,
> Here lies the renowned inventor,
> Whose flame to the skies ought to burn,
> But inverted descends to the center.

Later, in *The American Times*, writing under the pseudonym "Camillo Querno, Poet-Laureat to the Congress", Odell likened Benjamin Franklin to Satan, and his arrival at the French Court to a descent into hell. Dubbing Congress "Ye priests of Baal", "infernal crew", "democracy attended by a motley train", the parson satirized Franklin, Arthur Lee and Silas Deane, Commissioners to France:

> When it became the high United States,
> To send their envoys to Versailles' proud gates,
> Were not three ministers produc'd at once,
> Delicious group—fanatic, deist, dunce?
> And what if Lee, and what if Silas fell,
> Or what if Franklin should go down to hell,
> Why should we grieve? the land 'tis understood,
> Can furnish hundreds equally as good.

In a footnote, Odell added the following dialogue: "Dr. Franklin—"Know ye not me?,

said Satan fill'd with scorn, "Not to know me, argues yourself unknown."

Benjamin Franklin saw his son William for the last time shortly after the latter moved from Burlington to Perth Amboy, New Jersey, in 1774. Seized in 1776 and confined as a prisoner of war in Connecticut for over two years by the revolutionists, Governor Franklin eventually was exchanged to the British. In New York he became President of the Board of Directors of Associated Loyalists, an organization of which Jonathan Odell became assistant secretary. This association, in effect a stock company designed for plunder and revenge, demonstrated that the Loyalists were by no means all high-minded gentlefolk afflicted and overwhelmed by rebel riffraff. (During his imprisonment, William Franklin's wife had died and his home and library were lost. He returned to England in 1782 after a twenty year sojourn in America. His financial losses restored and pensioned by the British Government, he subsequently married an Irish lady and died in 1813 at the age of eighty-three.)

In the spring of 1782, when standards were presented to the King's American Dragoons in an imposing ceremony at New York, Odell, as Chaplain of the Corps, addressed a group of eminent British military officers, including Prince William Henry, later King William IV, who was then a midshipman in Admiral Digby's fleet. On July 1, 1783, Odell became assistant secretary to Sir Guy Carleton, Commander-in-Chief of the British Forces and Governor of New York.

By this time, however, Jonathan Odell had already been engaged in business far more sinister to the American cause. As a go-between, he had helped in the preparations for Benedict Arnold's treason, for with Odell's knowledge and probably with his aid, Joseph Stansbury met Major John André, Sir Henry Clinton's aide, in New York City. The parson served as an intermediary between Clinton and André in New York, and Stansbury and Arnold in Philadelphia. He met the messengers and deciphered much of the correspondence from Arnold, including the code letter of July 15, 1780, offering to sell West Point, and the note of September 15, 1780, informing Clinton and André when Washington might be captured while crossing the Hudson. Odell was authorized by Clinton to inform Arnold that André would meet him with regard to surrendering West Point. Odell's trusted messenger in this intrigue was John Rattoon, a vestryman of St. Peter's Church in Perth Amboy, who apparently was never suspected. In that dangerous correspondence, Odell was "James Osborne", Rattoon was "Mercury", and André was "John Anderson". (The complete Arnold-André correspondence recently came to light in the British Headquarter files preserved among the Clinton Papers now in the William L. Clements Library at the University of Michigan.)

In January 1784, Dr. Odell and his family accompanied Sir Guy Carleton to England, soon after the British evacuation of New York. Remaining implacable to the end, Odell did not leave off urging reprisals until the last Redcoat left the independent states. Hated and proscribed by his political opponents, the memory of Odell's fierce Toryism lingered long after his exile. In July 1800, "Peter Porcupine" in New York published a parody on Jonathan Odell styled after the Apostle's Creed. This abuse in words, too scurrilous to reprint, aimed a parting shot at the fiercest of Tory satirists. History has shown us, however, that no Loyalist ever approached Benjamin Franklin in intellectual distinction or political understanding, or Washington for power and dignity of command, or Jefferson as a master of written eloquence.

In November 1784, Jonathan Odell returned to America as Secretary and Councilor of the Canadian Province of New Brunswick, under Colonel Thomas Carleton, brother of his former chief. Odell continued in this office for twenty-eight years and was succeeded by his son, William Franklin Odell, who held the post an additional thirty-two years. Mrs. Odell became

the companion of her husband's years in exile and died in 1825 at Fredericton, N. B., at the age of eighty-five. Their two daughters also ended their days in Canada.

Styled "The Honorable and Reverend Jonathan Odell", the doctor also served as a vestryman of the parish at Fredericton, where he died on November 25, 1818. His gravestone there attests his early medical and clerical practice, his ardent devotion to the Royal cause, and the regret of family and friends.

Vernon L. Parrington, in his *Main Currents in American Thought*, succinctly summarizes the career of this hapless physician-clergyman from New Jersey:

> A vigorous man was Jonathan Odell, strong, capable, uncompromising, possessing a clear intellect and a heart little touched by Christian charity—a stern Hebraist who would sweep away with the besom of wrath all the enemies of his God and his King. . . . The alpha and omega of Odell's political faith was loyalty to the crown, and the bankruptcy of such a creed in revolutionary America is nowhere thrust into harsher relief than in the bitter verses of this bitter heart. . . . He was harshly intolerant in his Toryism, and he encountered a victorious republican harshness.

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Presentation of the Franklin Medal to the College of Physicians of Philadelphia[1]

By CLARENCE L. JORDAN[2]

IT IS a very special privilege for me to be delegated to bring you a brief report on the Medical Section of the Franklin Anniversary—and to present the College of Physicians of Philadelphia a token of deep appreciation from the Congress of the United States.

As most of you know, the year 1956 is the 250th Anniversary of the Birth of Benjamin Franklin. Throughout the world, 51 countries are joining in tribute to the many services Franklin performed for all mankind. They are following a plan which Franklin himself developed for the Second Continental Congress—the voluntary communication of ideas between peoples to help improve international understanding. Nearly 1000 organizations like yours in these countries prepare their own programs, in their own way and share them with each other as Franklin once did.

The results are truly inspiring. From South America, through Europe, Asia and back to us, The Franklin Institute estimates that more than 500,000,000 people have been reached in this international exchange of ideas in the fields where Franklin once made outstanding contributions.

Medicine is one of those fields. I think one of the most interesting experiences we had in helping to organize the Celebration was to call on The Medical Society of London and the famous old Medical Academy of France. We were fortunate in having the advice and counsel of Dr. Guy M. Nelson of Jefferson Medical College Hospital and Dr. William Nelson of Spartanburg, S. C., on the trip. Benjamin Franklin was a member of both of the leading Medical Societies of the 18th century. He was not a physician, as you know, but his services to the medical profession were so great and so numerous that he was honored by election to their membership.

It would take a much longer time than I have tonight to mention all of these services—his aid in founding our public hospital system; the invention of a flexible catheter and machine for showing circulation of the blood; the development of bi-focal glasses; use of electricity in treatment of paralysis; and research into the causes and prevention of many diseases.

It is this phase of *research* that is the basic theme of the medical section of the Anniversary. Franklin believed that both public and state should provide large sums for pure and basic medical research. Only a fraction of the millions spent on wars and armaments, he taught, could greatly increase the average life span and conquer many diseases.

Time, of course, has proved him right in this, as in so many other fields. The average life span, which was only about 30 years in Franklin's day, is now up to about 70. He believed it could eventually reach 100 years, provided the medical profession was given adequate funds for research, and the dedicated men to administer them wisely.

It is difficult to estimate the amount of money spent in medical research, because so much splendid work is done by individuals not connected with any of the regularly organized programs.

We do know that the public campaign goals set by the eleven major organized programs for 1955 were only $169,000,000—less than half of which went for research. Even when Federal and State appropriations are added, it is not likely that the total would exceed $250,000,000.

[1] Remarks made at the presentation ceremony, 4 April 1956.

[2] Vice President, The Franklin Institute; Chairman, International Franklin Anniversary Committee.

This is a pitifully small fraction of our national income that is running around $400 billions—or even our defense budget of $35 billions.

It is estimated that the world today is spending annually more than $100 billion dollars on military defense and ways to *destroy life.*

Probably less than 1% as much is spent on pure and basic research to save and lengthen lives.

Yet medical research is dealing with the happiness of more than two and one half billion people. If all Federal, State and Public contributions were five times as large as they are now, the amount would still be only a small effort for so large an objective.

In this exchange of ideas from many parts of the world, we find that the greater spread of medical knowledge and research is probably the most important single thing in winning international friendship and understanding. The uncounted millions who die prematurely every year for lack of it is a shameful blot on our civilization.

In India and many countries of Asia, comprising nearly half of the population of the world, the average human life-span is no longer now than it was in Franklin's age. And even in the most advanced civilizations, like our own, there is practically no provision for one of the most serious and complicated medical problems that confronts us.

Dr. Pierre Lepine, of the French Academy, in his magnificent paper on "Franklin—and the Unconquered Fields of Medicine" explains this problem that all too few of us are willing to face. He points out that, as the Profession conquers one class of diseases, like smallpox, cholera, plague, yellow-fever and typhus—which derive largely from the spread of germs in unsanitary conditions—an entirely new set of diseases arise in the higher standards of living developed by technological improvement.

This process has been going on since the dawn of scientific history. The elimination of certain causes of disease leaves a clear field for others, and we must recognize a completely new pathology, Dr. Lepine warns, "created by man and for which he is directly responsible"—the rising tide of mental diseases, cardiac disturbances, chronic instability and dementia.

"Man has shortened distances and time." Dr. Lepine says, "He has freed energy from matter, but the creations of his genius only bring out the fragility of his brain, the limits of his resistance and the inescapable consequences of his insubordination to the laws of nature."

The problems of medical research cannot be solved, as too many people fondly think they can, even by the magnificent achievements in finding the answer to virus infections and certain degenerative diseases.

The onward march of technology in industry has created a second industrial revolution in the amazing trend toward automation. In its wake automation will leave shattered lives as tragically as any plague that ever confronted mankind. No one knows, for sure, what part it may be playing in the seriously over-crowded conditions of our mental hospitals and the frightening spread of mental illnesses.

Sir Zachary Cope, Fellow of The Medical Society of London, says that "medicine is now a science, based upon a series of exact sciences and itself conducted in a scientific way."

It must therefore, keep pace with the onrushing science of technology in all the things that affect man. The need for medical research will not be diminished even when the cure is found for cancer, heart and circulatory diseases, arthritis and other current troubles.

The goal simply must be shifted to meet new problems as civilization develops them.

People must be taught to understand this condition by public communications, as Franklin proved they could be. Once they understand the concept, support for medical research should progress as never before in history.

This is one of the objectives of the Franklin Anniversary. We hope to help create an awareness of this need in Poor Richard's own way of mass communications. Those of you who

have the opportunity to look at television on channel 6, Monday night, April 9th at 9:00 o'clock—will see something of the way Benjamin Franklin went about it in helping to found our nation's hospital system.

When the Congress of the United States met to decide what action it would take in honoring Franklin's Anniversary, they decided to create a Medal to be awarded to those Institutions with a Franklin tradition, which have helped so much in the achievement of his objectives. They felt that the highest tribute they could pay to Benjamin Franklin was to recognize and honor the work of men and women who have carried on these ideals of service.

The Philadelphia College of Physicians is one of those institutions. Carl Van Doren, in his magnificent Biography of Franklin, states that on his death, 20 Fellows of this College marched in tribute to the man who had written the "Rules Respecting a Medical Education and a Degree"—which the College had adopted.

From those early days 'till now, the College of Physicians has kept bright the highest objectives of professional services.

I am very proud to bring this Medal to you tonight. On it you will note the words taken from Benjamin Franklin himself.

"Wise and Good Men Are the Strength of a Nation"

The complete quotation added the words—"Far More Than Riches or Arms."

Franklin believed that, some day, the position of a country in the Councils of Nations would be decided not alone by its material power and armament, but by the contributions of its "Wise and Good Men" to the service of humanity.

The Congress of the United States honors that philosophy in the creation of this Franklin Medal. In presenting it to the College, Dr. Scheffey, I am authorized to say that Congress pays tribute, not only to the memory of Franklin, but also to the "Wise and Good Men" who have been—and are—members of this great Institution.

Transactions of the Sections

SECTION ON GENERAL MEDICINE

23 January 1956

Acute Peptic Ulcer Occurring after Cardiac Surgery. Donald Berkowitz,* M.D., Brenard Wagner,* M.D., and Joseph F. Uricchio,* M.D. (Discusser: Harry Shay, M.D.) (*Abstract 1, below*)

Some Observations on the Effect of Intra-Arterial Histamine in Peripheral Arterial Disease. Raymond Penneys, M.D., and Carlos Forno,* M.D. (Discusser: Daniel J. Marino,* M.D.) (*Abstract 2, below*)

Delayed Sensitivity of the Skin to Phenyl Mercuric Acetate. F. William Sunderman, M.D. (Discusser: Henry B. Decker,* M.D.) (*Abstract 3, below*)

The Implications of Multiple Attacks of Viral Hepatitis in a Narcotic Addict. W. Paul Havens, Jr., M.D. (Discusser: Joseph Stokes, Jr., M.D.) (*Abstract 4, below*)

27 February 1956

Motor Involvement in Herpes Zoster. Norman Learner, M.D. (Discusser: Sherman F. Gilpin, Jr., M.D.) (*Abstract 5, below*)

Echinococcus as the Cause of Circulatory Embarrassment. Nicholas Padis, M.D., and J. Montgomery Deaver, M.D. (Discusser: William G. Sawitz,* M.D.) (*Abstract 6, below*)

Value of Combined Study of Serum Enzymes and Duodenal Contents after Secretin in Evaluation of Pancreatic Function. David C. H. Sun,* M.D., and Harry Shay, M.D. (Discusser: M. S. Lopusniak,* M.D.) (*Abstract 7, below*)

Gastric Varices Simulating Gastric Carcinoma. George T. Wohl, M.D. (Discusser: Charles M. Thompson, M.D.) (*Abstract 8, below*)

* By invitation.

23 April 1956

The Relation of Adrenal Steroids to Auriculoventricular Conduction. Walter L. Arons,* M.D., Bernard Lown,* M.D., William F. Ganong,* M.D., Jehangir P. Vazifdar,* M.D., and Samuel A. Levine,* M.D. (Discusser: John J. Sayen, M.D.) (*Abstract 9, below*)

Chronic Pulmonary Inflammation and Fibrosis. Harold L. Israel, M.D., and William J. Beckfield, M.D. (Discusser: Herman Ostrum,* M.D.)

The Termination for the Common Bile Duct. Julian A. Sterling, M.D. (Discusser: Henry J. Tumen, M.D.)

Clinical Evaluation of a New Oral Anticoagulant 'Sintrom' (Nitro-phenyl-Acetyl-Ethyl-4-Oxycumarin). Emmett C. Neill,* M.D., Richard Y. Moon,* M.D., and Joseph B. Vander Veer, M.D. (Discusser: Leandro M. Tocantins, M.D.) (*Abstract 10, below*)

28 May 1956

Prevention of Thorazine Jaundice. Harry Shay, M.D., and Herman Siplet,* A.B. (Discusser: S. A. Freyhan,* M.D.)

Association of Ascites with Laennec's Cirrhosis. W. Paul Havens, Jr., M.D., and Paul Weis,* M.D. (Discusser: W. Paul Havens, Jr., M.D.)

Allergic Headache. Perry S. Mac Neal, M.D. (Discusser: Harry L. Rogers, M.D.)

SECTION ON MEDICAL HISTORY

17 January 1956

Benjamin Franklin and Antoine Laurent Lavoisier. Herbert Klickstein,* M.D. (*Abstract 11, below*)

Dr. Jonathan Odell—Tory Satirist. Fred B. Rogers, M.D.

Benjamin Franklin's Vision of the Extension of Human Life to Antediluvian

Standards. Walton B. McDaniel, 2nd*, ph.d. (*Abstract 12, below*)

3 April 1956

The Lasting Influence of Sir Thomas Browne.[1] Jeremiah S. Finch,* ph.d. (Kate Hurd Mead Class of 1888 Lecture in Medical History, Woman's Medical College of Pennsylvania).

SECTION ON OPHTHALMOLOGY[2]

19 January 1956

Endothelial Dystrophy Associated with Multiple Malignant Melanomata (A Histopathologic Case Report). William C. Frayer, m.d.

Turbidimetric Measurement of Streptococcal Antihyaluronidase in Uveitis and Primary Glaucoma. Joseph W. Hallett, m.d., and I. H. Leopold, m.d.

Ophthalmology in India. Richard A. Ellis,* m.d.

16 February 1956

Surgery of Congenital Cataract with Special Reference to Complications of Surgery. Paul A. Chandler,* m.d.

15 March 1956

Routine Tomometry. H. P. Kirber,* m.d.

Visual Aids for Subnormal Vision. Bernard C. Gettes, m.d.

Bilateral Mooren's Ulcer Treated by Quadrilateral Penetrating Keratotomy. R. D. Harley,* m.d.

The Electroretinogram in the Human during Blackout. T. D. Duane,* m.d.

19 April 1956

The Toxic Amblyopias—A Re-evaluation. Albert M. Potts,* m.d.

[1] Printed in the *Transactions & Studies*, 4th Ser., vol. 24, no. 2, August, 1956.

[2] Abstracts of the presentations at this Section customarily appear in the *American Journal of Ophthalmology* and the *A.M.A. Archives of Ophthalmology*.

SECTION ON OTOLARYNGOLOGY[3]

18 January 1956

(Joint Meeting with the Philadelphia Laryngological Society)

Experimental and Clinical Studies on Deafness. Harold F. Schuknecht,* m.d.

15 February 1956

(Joint Meeting with the Philadelphia Laryngological Society)

Osteomyelitis of the Frontal Bone. C. Stewart Nash,* m.d.

Role of the Radiologist in Diagnosis of Malignancies of the Paranasal Sinuses. Roderick L. Tondreau, m.d.

Role of the Radiologist in the Treatment of Malignancies of the Paranasal Sinuses. Roy P. Greening, m.d.

Surgical Management of Malignancies of the Paranasal Sinuses. LeRoy A. Schall,* m.d.

21 March 1956

(Joint Meeting with the Section on Otolaryngology of the New York Academy of Medicine, held in Philadelphia)

Some Anatomic Points about the Larynx. Oscar V. Batson, m.d. (Discusser: Daniel C. Baker,* m.d.)

The Tympanic Cavity and Auditory Ossicles; Roentgen Findings in Health and Disease. Philip J. Hodes, m.d., Roderick L. Tondreau, m.d., and Philip A. Marden, m.d. (Discusser: Irving Schwartz,* m.d.)

The Dermatological Background of Otitis Externa. Eldon T. Perry,* m.d. (Discusser: Joseph L. Goldman,* m.d.)

18 April 1956

Toxic Psychosis Following Aspiration of Foreign Body. Murlin K. Ewell,* m.d. (Discusser: Joseph P. Atkins, m.d.)

Motion Picture: Dacryocystorhinostomy

[3] Abstracts of the presentations at this Section customarily appear in the *A.M.A. Archives of Otolaryngology*.

—Combined External and Intranasal Operation on the Lacrimal Sac. Kelvin A. Kasper, M.D.

The Adrenal Corticosteroids—Fundamental Basic Concepts. Thomas F. Flynn, Jr.,* M.D.

SECTION ON PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE

7 February 1956

(Joint Meeting with the Philadelphia County Medical Society)

Panel Discussion on Poliomyelitis

Moderator: Philip S. Barba, M.D.

Progress of the Vaccination Program. Louis L. Coriell,* M.D.

Vaccination Program of the Philadelphia Health Department. Norman R. Ingraham, M.D.

Poliomyelitis Diagnostic Services. Klaus Hummeler,* M.D.

Hospitalization of Poliomyelitis Patients. A. C. LaBoccetta, M.D.

6 March 1956

(Joint Meeting with the Pennsylvania Public Health Association, Region One)

Mastering Long Term Illness. Edward L. Bortz, M.D. (Arthur Parker Hitchens Lecture)

ABSTRACTS

Abstract 1

Acute Peptic Ulceration Following Cardiac Surgery. Donald Berkowitz, M.D., Bernard Wagner, M.D., and Joseph Uricchio, M.D.

We have described 4 cases of acute peptic ulceration of the stomach and duodenum occurring after cardiac surgery. This is a most serious complication—3 of the patients having died as a direct result, whereas the other survived only because of emergency gastric surgery.

Since these acute ulcers usually give no warnings, the physician who is caring for these patients must constantly be on the alert for this possibility.

Early surgery may be life saving in these cases, rather than a more conservative program of therapy and should not be withheld merely because the patient has recently undergone cardiac surgery.

Abstract 2

Some Observations on the Effect of Intra-Arterial Histamine in Peripheral Arterial Disease. Raymond Penneys, M.D. and Carlos Forno, M.D. Vascular Section, Robinnette Foundation, Hospital of the University of Pennsylvania

From 0.95 to 2.75 mgms of histamine acid phosphate (2.75 mgs/500 cc physiological saline) were injected into the femoral artery of patients with arteriosclerosis obliterans of the lower extremities. Skin blood flow, as measured by skin temperature in a thermoregulated room averaging 22°C., increased throughout the injected extremity; the increase in temperature during, or soon after, the injection averaged 2.4°C. in the thigh, 1.8°C. in the leg and 1.1°C. in the toes (32 experiments). In contrast, the average skin temperature in the toes of the control, non-injected leg, decreased 1.3°C. Skin oxygen tension of the toes, measured polarographically in a few experiments, changed in the same direction as the skin temperature. Three of the six patients with ischemic ulceration, or pre-gangrenous changes, appeared to be helped by the injection. Two of the three patients with intermittent claudication receiving three or more injections had some improvement in walking distance. Forty-two injections were given to 11 patients with no untoward reactions.

Intra-arterial histamine injections are of value in the treatment of peripheral arterial disease.

Abstract 3

Delayed Sensitivity of the Skin to Phenylmercuric Acetate. F. William Sunderman, M.D., Ph.D.

Studies are reported on a patient who developed severe delayed sensitivity of the skin with formation of bullae following exposure to a saturated solution of phenylmercuric acetate in benzene. The blister fluid yielded mercury in a concentration of 40 mg/liter and was high in gamma globulin. It is proposed that if vesication should develop following contact with organomercurial salts, the serous fluid should be aspirated as rapidly as it is formed in order to remove the mercury that may accumulate.

Abstract 4

THE IMPLICATIONS OF MULTIPLE ATTACKS OF VIRAL HEPATITIS IN A NARCOTIC ADDICT. W. Paul Havens, Jr., M.D.

Three apparently self-limited episodes of jaundice occurred at intervals of one year in a narcotic addict who had been receiving intravenous injections in group practice of narcotic administration as often as once a week over a period of three years. Clinical and laboratory evidence indicated that the cause of jaundice on each occasion was due to hepatitis and not to excessive hemolysis or to extrahepatic obstruction of the common bile duct. The fact that a year elapsed between each episode is against the concept that these attacks represented relapses of the original disease. Likewise, the evidence of clinical and functional recovery after each attack and the normal histologic appearance of the liver revealed by biopsy at the end of the third episode indicated that this patient did not have chronic hepatitis. Although it is impossible to define accurately the factors that potentiated three attacks of hepatitis, the following lines of speculation are valid in view of the relatively solid immunity usually associated with infection with hepatitis virus A and the poorly defined immune response following infection with hepatitis virus B. If one attack of hepatitis was caused by virus A, the other two might have been caused by: (a) a strain of virus B that evoked insufficient antibody to prevent re-infection or (b) immunologically different strains of virus B. If, however, virus A was not operative, all three attacks might have been caused by a strain or strains of virus B. The possibility must also be considered that this patient might be a carrier of hepatitis virus B in the blood and that, under certain circumstances, the equilibration between host and virus might be so disturbed as to result in repeated attacks of clinical disease.

Abstract 5

MOTOR INVOLVEMENT IN HERPES ZOSTER. Norman Learner, M.D.

The possibility of motor involvement in herpes zoster is not commonly appreciated. A good number of cases of herpes zoster ophthalmicus complicated by palsies of the oculomotor, trochlear or abducens nerves have been reported. In addition, the Ramsay-Hunt syndrome (otic zoster with facial palsy) is well recognized. However, herpes involving the trunk or extremities associated with paralysis is rare. The case is presented of a 46 year old male who developed pain in the right loin and right lower quadrant. One week later he noted the appearance of a mass in the right loin. Examination disclosed this mass to be hemispherical and most evident in the erect position. There was considerable hyperesthesia in this area. X-ray of the abdomen and laboratory studies were not remarkable. Two days after the appearance of the mass herpetic lesions appeared in the distribution of T-12 on the right. Lumbar puncture revealed clear fluid under pressure of 180 mm. of water, no cells, protein 50.4 mg. per 100 cc., negative Kolmer and normal colloidal gold curve. Electrical testing revealed partial reaction of degeneration of the right abdominal muscles. The herniation persisted for several months but finally disappeared.

Abstract 6

CASE PRESENTATION OF ECHINOCOCCUS AS THE CAUSE OF CIRCULATORY EMBARRASSMENT. Nicholas Padis, M.D. and J. Montgomery Deaver, M.D.

This 55 year old white man came to the United States from Macedonia in 1913. He returned to Greece for several months in 1937,

partaking again of poorly cooked lamb at native festivals. In June 1950, he experienced gastrointestinal upset and dyspnea; physical examination at that time revealed an orange sized mass in his epigastrium. Total achlorhydria coexisted.

In November 1954, signs of cardiac failure appeared with moderate peripheral edema. Epigastric and right upper abdominal masses, of grapefruit size, were palpable in his abdomen. In December 1954, laparotomy was necessary for excision of multiple hydatid cysts seeding the abdominal cavity. A large cyst in the left lobe of the liver was also excised and marsupialized at that time. It was evident that the echinococcus cysts presented mechanical obstruction to the abdominal circulation with secondary cardiovascular symptoms. Removal of cysts produced symptomatic improvement. The patient had an uneventful convalescence and returned to work.

Abstract 7

VALUE OF COMBINED STUDY OF SERUM ENZYMES AND DUODENAL CONTENTS AFTER SECRETIN IN EVALUATION OF PANCREATIC FUNCTION. David C. H. Sun, M.D., D.SC. (Med.) and Harry Shay, M.D.

A combined study of serum enzymes and duodenal contents after intravenous administration of 80 units of secretin was done in 30 normal subjects and 36 patients with pancreatic disease. Samples of gastric and duodenal contents were collected separately by two Rehfuss tubes for 10, 10, 20 and 20 minute periods after stimulation. Volume, pH and bicarbonate concentration of the duodenal contents were determined. Blood samples were taken before and at 1, 2, and 4 hours after secretin and analyzed for serum amylase and lipase activity.

In normal subjects, secretin stimulation produced no significant increase in concentration of serum enzymes. A response was considered to be positive only when enzyme values rose above the upper limits of normal. The lower limit for volume of duodenal contents after secretin was 1.8 ml./hr./kg. and for maximum bicarbonate concentration 65 mEq/l.

In five patients following acute pancreatitis whose fasting serum enzymes were normal, secretin injection produced a significant increase in four. However, these four patients had normal duodenal findings. In the two patients who had fasting hyperenzymemia, secretin injection produce a further increase in enzyme values. Both had low values for the duodenal contents.

In ten tests done in seven patients with chronic pancreatitis whose fasting serum enzymes were normal, four showed a significant increase after secretin injection. In the five patients who had fasting hyperenzymemia, secretin injection produced a further increase in some. In twelve tests in which the duodenal contents were studied as well, eleven showed a low value. Thus, of the 18 secretin tests carried out in 15 patients with pancreatitis in whom a combined study was done, 17 showed an abnormal response in one or both.

In the group with cancer of the pancreas, secretin stimulation produced a significant increase in serum amylase in only one of seven patients whose fasting serum enzyme concentrations were normal. A negative secretin serum enzyme response was observed in four patients who had fasting hyperenzymemia. All seven patients who also had duodenal contents studies showed low values.

The relative changes in the pancreas resulting from disease in duct obstruction or acinar destruction or both will determine the changes that will be found in serum enzymes and in the duodenal contents.

Abstract 8

GASTRIC VARICES SIMULATING GASTRIC CARCINOMA. George T. Wohl, M.D.

Patients with hematemesis poses an urgent diagnostic problem for both the clinician and radiologist. In over 95% of patients hematemesis is due to one of four major causes—peptic ulcer, gastritis and duodenitis, gastric malignancy, and complications of cirrhosis and portal hypertension. Three patients are pre-

sented in whom the clinical problem was serious hematemesis. In each of these patients a mass lesion in the cardiac end of the stomach was found diagnosed pre-operatively as gastric neoplasm. Each of these patients on surgical exploration was proven to have gastric varices simulating gastric neoplasm. The differential diagnosis from the roentgen standpoint is discussed. The anatomy of the portal system is discussed and reviewed. It is emphasized that in portal hypertension a prominent finding is marked dilatation of the coronary vein and of the esophageal veins. It is further pointed out that the coronary vein drains the lesser curvature of the stomach and, massively dilated, the tributaries of the coronary vein in the submucosa of the stomach may manifest themselves by intraluminal projections simultating gastric carcinoma. It is suggested that where the patient presents the problem of portal cirrhosis with or without esophageal varices, a percutaneous splenoportogram by reflux through the dilated coronary vein may make an absolute diagnosis feasible preoperatively. This will enable the surgeon to plan his approach more adequately.

Abstract 9

THE RELATION OF ADRENAL STEROIDS TO AURICULOVENTRICULAR CONDUCTION. By Walter L. Arons, M.D. (In collaboration with Drs. Bernard Lown, William F. Ganong, Jehangir P. Vazifdar and Samuel A. Levine.)

The role of endocrine factors in determining the duration of auriculoventricular conduction has not been recognized. A comparison of the P-R intervals in the electrocardiograms of fifty patients with partially or totally untreated Addison's Disease and thirty-four patients with untreated Cushing's Syndrome was made. Ten of the fifty patients with Addison's Disease exhibited first degree heart block and in only one was the P-R interval less than 0.13 sec. The mean P-R interval for the hypoadrenal group based on 219 electrocardiograms was 0.176 sec. compared to a control value of 0.158 sec. in 539 control subjects. On the other hand, in seventeen of thirty-four patients with Cushing's Syndrome, the P-R interval was 0.13 sec. or less and in only one patient did it exceed 0.18 sec. The mean P-R interval of the hyperadrenal group was 0.136 sec. With successful treatment of the underlying adrenal insufficiency or the adrenocortical hyperactivity, the P-R intervals in both groups tended to change in the direction of the mean control group value. Apparently the C_{11} oxysteroids of the adrenal cortex are responsible for this effect on auriculoventricular conduction since the administration of cortisone but not desoxycorticosterone acetate to the untreated Addisonian is successful in shortening the P-R interval toward normal. A gross correlation is apparent from the data, from the cases of Cushing's Syndrome, between the length of the P-R interval and the urinary steroid excretion values. Physiologic and diagnostic implications of these findings shall be discussed.

Abstract 10

CLINICAL EVALUATION OF A NEW ORAL ANTICOAGULANT "SINTROM" (NITRO-PHENYL-ACETYL-ETHYL-4-OXYCUMARIN). Emmett C. Neill, Jr., M.D., Richard Y. Moon, M.D. and Joseph B. Vander Veer, M.D.

One year's experience with the clinical use of a new coumarin anticoagulant, "Sintrom", is reported. One hundred Sintrom treated cases with thrombo-embolic disorders are compared with one hundred Dicumarol treated cases and one hundred sixteen patients who received Tromexan. Sintrom offered certain advantages: (1) It usually induces a therapeutic prothrombin level in thirty six hours. (2) A therapeutic effect is easily maintained. (3) It is rapidly excreted and metabolized. (4) Vitamin K_1 counteracts its effect within a few hours. (5) The dosage is relatively constant in a given patient. (6) No toxicity has been observed. (7) It is well tolerated when administered orally.

Abstract 11

BENJAMIN FRANKLIN (1706–1790) AND ANTOINE LAURENT LAVOISIER (1743–1794). Herbert S. Klickstein, M.D.

The scientific universality and genius of Benjamin Franklin are evident from even a casual perusal of his works and manuscripts. Although other commitments, principally of a business or political nature, were to occupy him throughout his life, he found time for studying the sciences, which had great appeal to his inquisitive and imaginative nature, and his endeavors in this direction were by no means superficial. He manifested an active interest in chemistry and although he himself never experimented extensively, his acquaintance and correspondence with many eminent chemists kept him abreast of the progress in this field. Chemistry was in a flux in the latter decades of the eighteenth century and was slowly emerging as an exact and true discipline. One of the most important contributions to this transformation was the overthrow of the *phlogiston* theory by Antoine Laurent Lavoisier; his *new chemistry* was truly the beginning of the modern phase of chemistry and has been aptly termed the "revolution in chemistry." Although the friendship of Franklin and Lavoisier is generally known, the full story seems to have been overlooked since not only were they colleagues, who mutually understood and appreciated each other's works, but they were also in several instances collaborators on important scientific studies.

One of Franklin's initial correspondents on the subject of chemistry was Joseph Priestley who was the principal advocate of the *phlogistic* theory. Priestley kept Franklin informed of all the advances in his chemical work, particularly as applied to the discoveries of Lavoisier. In turn Lavoisier and his disciples strove to convert Franklin to the *new chemistry*. Franklin was, therefore, indoctrinated with both the *phlogistic* and *anti-phlogistic* schools of chemistry by their chief advocates. Apparently Franklin never completely abandoned Priestley, but whether it was because he did not fully understand Lavoisier's contributions or whether he did not care to involve himself in the polemics is not clear. In any case, Lavoisier and Franklin not only discussed the *new chemistry* together, but they collaborated on three joint studies—the construction of gunpowder magazines, the aerostatic balloon, and animal magnetism. It is in these investigations that they were to work the closest and in complete agreement.

Abstract 12

BENJAMIN FRANKLIN'S VISION OF THE EXTENSION OF HUMAN LIFE TO ANTEDILUVIAN STANDARDS. W. B. McDaniel, 2d, PH.D.

In 1780, Franklin wrote to Joseph Priestley: "The rapid progress *true* science now makes, occasions my regretting sometimes that I was born so soon. It is impossible to imagine the height to which may be carried, in a thousand years, the power of man over matter . . . all diseases may by sure means be prevented or cured, not excepting even that of old age, and our lives lengthened at pleasure even beyond the antediluvian standard."

Some reasons for Franklin's optimism, and for his reliance on biblical accounts of longevity, were presented. Consideration was given to modern estimates that, in the course of about 2,000 years, life expectancy has advanced from 18 to 69.8 years, practically doubling at the present time what it was in Franklin's day; that no man has lived longer than about 114 years; and that the average can not be pushed up much above 100 years. Reasons for the advance since Franklin's day were touched upon, the present situation briefly reviewed, including a statement by a modern biologist carrying on Franklin's optimistic attitude towards man's capacity to control his destiny.

It was suggested that, while continuing our advance toward greater longevity, we might now and then ponder another observation of Franklin's, made when he was an old man who, according to political arithmetic and his own sense of decorum, ought to have been long since undisturbably "abed and asleep". "Life," he said, "like a dramatic piece, should not only be conducted with regularity but methinks it should finish handsomely."

College Notes

New Fellows

The following were elected Fellows on the dates listed:

4 April 1956

John W. Carnwath
Robert J. Hill
Charles H. Sillars

23 May 1956

Harold Goldberg
June F. Klinghoffer

Necrology

ROBERT K. H. CHARR

Robert K. H. Charr was born in Korea on August 8, 1904. He was educated in mission schools in Korea and at Nanking University and Huron College. He received his M.D. from Jefferson Medical College in 1931.

Dr. Charr served as Assistant in the Institute of Pathology at Frankfurt-am-Main in 1935 and 1936. He was Associate Physician at the Pennsylvania Hospital and Assistant Professor of Medicine at Jefferson Medical College.

Dr. Charr was elected to the College of Physicians of Philadelphia on March 1, 1939. He was a fellow of the American Medical Association, the American College of Physicians, and the American College of Chest Physicians. He was a member of the American Trudeau Society. He received his certification from the American Board of Internal Medicine in 1947. Dr. Charr was elected a member of Alpha Omega Alpha.

Dr. Charr married Elizabeth Haines in 1936, and the family later included a daughter, Betsy. Dr. Charr was active in church affairs, serving as an Elder of the First Presbyterian Church in Philadelphia. He died on January 29, 1956, at Jefferson Medical College Hospital.

JOHN M. CRUICE

John M. Cruice was born in Philadelphia, December 12th, 1873. He received his B.S. from the University of Pennsylvania in 1894, and his M.D., in 1898, from the same institution.

Dr. Cruice had been a member of the staff at St. Joseph's Hospital since 1899, and had acted as Secretary of their Board of Managers. He also served as Chief of Staff at both St. Joseph's and St. Agnes' Hospitals. He was one of the founders of Doctor's Hospital and for several years was an assistant physician in the Out-Patient Department of the University of Pennsylvania Hospital.

Dr. Cruice entered the Medical Corps, U. S. Army, as a Captain, on May 15, 1917. He served with Base Hospital No. 10 until Oct. 4, 1918, when he was transferred, as Division Medical Gas Officer, to the 78th Division, A.E.F. He was discharged, as a Major, on March 19, 1919.

Dr. Cruice was elected to the College of Physicians of Philadelphia on March 2, 1904. He was a member of the American Medical Association, Philadelphia County Medical Society, John Morgan Society, and the Men of Malvern.

On October 3rd 1918 Dr. Cruice married Sarah Hopkins. The family includes three sons: Robert Blake, J. Seth, and John M., Jr. Dr. Cruice died at St. Joseph's Hospital, Philadelphia, on January 3, 1956.

LOWELL A. ERF

Lowell Ashton Erf was born in Columbus, Ohio, on March 17, 1908. He received his B.S. and M.D. degrees from Ohio State University, the latter in 1931.

Dr. Erf became a diplomate, National Board of Medical Examiners, in 1932. He served as resident at the Ohio State University Hospital, and as hematologist at the Mount Sinai Hospital in New York. He also did work in hematology at the Rockfeller Institute (1937–1939).

In 1939 he married Evelyn Donnelly. Dr. Erf was an Assistant in Medicine from 1939 to 1941 at the University of California School

of Medicine. He served in the war as a Captain, Medical Corps, A. U. S. He subsequently came to Jefferson Medical College and was appointed Assistant Professor of Medicine and Assistant Director of the Charlotte Drake Cardeza Foundation. Dr. Erf also was Director of the Plasma-Transfusion Unit at Jefferson.

Dr. Erf was elected a member of the College of Physicians of Philadelphia on January 7, 1953. He was also a member of the American Medical Association, Philadelphia County Medical Society, several state medical societies, the Association for Cancer Research, and the Harvey Society. Dr. Erf was a fellow of the American College of Physicians. He died on January 30, 1956, at the Garden Court Plaza in Philadelphia.

REUBEN FRIEDMAN

Reuben Friedman was born in Philadelphia on December 14, 1892. He graduated from Central High School in 1912, and received his M.D. from Temple University in 1916. He did graduate work in Vienna in 1922 and 1923, and at the University of Pennsylvania in 1930.

Dr. Friedman interned at the Philadelphia General Hospital from 1916 to 1918. Later he served as an Associate in Dermatology at the Philadelphia Hospital for Contagious Diseases. He became Chief of the Clinic and Attending Dermatologist at Temple University Hospital. He also acted as Attending Dermatologist at the Skin and Cancer Hospital of Philadelphia, and as Visiting Lecturer in Dermatology and Syphilology at the Graduate School of Medicine of the University of Pennsylvania.

In 1927 Dr. Friedman became an Instructor in Dermatology and Syphilology at the Temple University School of Medicine. He subsequently advanced to the posts of Lecturer, Associate, Assistant and Associate Professor. Appointed a Clinical Professor in 1951, he was promoted to Professor of Clinical Dermatology at Temple University School of Medicine in 1955.

Dr. Friedman was elected a fellow of the College of Physicians of Philadelphia on May 6, 1942. He was also a member of the American Academy of Dermatology and Syphilology, the Society for Investigative Dermatology, and the American Association of the History of Medicine. Dr. Friedman was certified in his specialty by the American Board of Dermatology and Syphilology in 1939. He was a corresponding member of the Italian Society of Dermatology and Syphilology, the Cuban Society of Dermatology and Syphilology, and the Cuban Society of Cancerology.

On May 27, 1920, Dr. Friedman married Henrietta Poland. Their union produced two children: Mrs. Grace F. Ross and Mr. Ralph B. Friedman. Dr. Friedman died at Temple University Hospital on February 4, 1956.

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(February 1957)

Hemorrhage, Thrombosis and the Blood Platelets[1]

By Leandro M. Tocantins, M.D.

THOMAS DENT MÜTTER had been Professor of Surgery at Jefferson Medical College for fifteen years when he resigned, three years before his death, at the age of 48. Mütter was, perhaps, one of the first surgical pathologists in America, and one in the true sense. He divided his time between surgical operations and the study and cataloguing of the organs and parts that he removed, or were given to him by his colleagues. The Mütter Museum of our College is an outgrowth of his collections. Mütter also saw to it that a course of lectures, dealing with subjects in surgical pathology, was given at stated periods. The present lecture, the sixty-eighth of the series, was made possible by these provisions. As a surgical pathologist, Mütter would have probably been interested in the subject of tonight's lecture, since hemorrhage and thrombosis are familiar events to both surgeons and pathologists.

I am deeply appreciative of the honor of having been selected to give this year's lecture. My remarks are based on studies made over the relatively short span of nearly twenty-five years, during which my co-workers and myself have been engaged in observing these phenomena. I owe my original interest in the subject to Harold W. Jones, a long-term member of this College, who has shown a genuine interest in furthering the cause of hematological research. I have also had the encouragement and support of many associates in the Charlotte Drake Cardeza Foundation and of the members of the Attending and Teaching Staff of the Jefferson Medical College and Hospital, and of the Pennsylvania Hospital. Without their help and enthusiastic support, the continuity of this work could not have been maintained.

In this lecture, I shall attempt to acquaint you with some little known properties of platelets, and the role they play in the mechanisms of hemostasis and thrombosis. What manner of a body is the platelet? What does it do? What is its eventual fate? These are some of the questions that we shall attempt to answer, perforce in an incomplete manner.

PHYSICOCHEMICAL CHARACTERISTICS

In the circulating blood of *Mammalia* the platelet appears as a pale, colorless, slightly elongated, flat disc, resembling a lentil. When

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platelets are in a suspension of isotonic salt solution, they impart to it a light blue color similar to that of a finely divided white soap emulsion; when in a tightly packed mass, they are milky white. The altered platelet may assume many shapes, resulting mainly from the operation of surrounding forces. If blood is collected with proper precautions and rapidly fixed, the platelet appears made up of a smooth homogeneous substance, with fine granules spread throughout it, difficult to resolve at 1200 × magnification. In dry stained smears of imperfectly fixed blood, platelets appear divided into two zones, the clear hyalomere in the periphery and the chromomere, made up of granules accumulated in the center. This separation into two zones is probably caused by changes in the granular material within the platelet after leaving the vessel. When blood is collected directly into a fixing fluid (formalin, osmic acid), the platelets are instantaneously fixed; subsequent staining with Giemsa will show the stain evenly distributed through the body of the platelet, with no sharp zone of separation between chromomere and hyalomere. Studies of platelets by electron microscopy have contributed to further knowledge of their inner structure that may help in the detection of morphological differences as yet unsuspected (2, 6).

It is impossible to avoid observing, in the course of the study of blood of patients with hemorrhagic disorders, the appearance of abnormal platelet forms. Large (as long as 50 microns) platelets with deep staining hyperchromatic granules may be observed in various disorders of the blood, especially in myeloid leukemia, in the regenerative stage of thrombocytopenias, the various thrombocytopathic purpuras, and in other disorders, such as acute infections and postoperative states (e.g., splenectomy). Such forms may be interpreted as representing evidence of accelerated or defective platelet production.

As late as 1938 little was known regarding the chemical composition of platelets. In the last few years here and abroad much has been contributed to this subject. According to Maupin (22), the mineral composition of horse platelets, in terms of percent of dry weight, is as follows: sodium 0.24%; potassium 0.031%; calcium 0.096%; magnesium 0.02%; copper 0.0012%; iron 0.00065%; manganese 0.00016%. Zinc, apparently, is absent in platelets, though constituting an important element in leukocytes. According to one of the early works (13) on platelets the platelets of horses have the following chemical composition: protein 71%, lipids 12% (of which 1.7% is cholesterol), ash 5.5%. The specific gravity of horse platelets, as calculated by Maupin (21) in 1954, is 1.054, as compared with 1.085 for horse red cells and 1.058 for leukocytes.

Three of the best known and fundamental characteristics of platelets are their propensity (a) to adhere to certain surfaces (glass, damaged endothelium), (b) to agglutinate to each other and form large white masses, and (c) to undergo swelling and granular transformation and loss of their individual identity ("viscous metamorphosis"). These phenomena were first observed by Bizzozero (3) in the lumen of injured living vessels. The substances capable of producing the viscous transformation are found in the blood and are associated with the early stages of blood coagulation. The change is best detected when fresh serum is used and was once studied by Osler (27) who referred to the altered platelets as the "granular masses of Schultze." An appreciation of the role played by the platelet in hemorrhage and thrombosis must be done against the background of these three fundamental changes which can be easily observed "ex vivo."

In 1912, J. M. O'Connor (25) had observed that while serum has a marked vasoconstricting action, plasma itself had little. He and Stewart and Zucker (30) showed that aqueous extracts of rabbit and horse platelets exerted a strong vaso-constrictive action. Further studies of this phenomenon by Page and co-workers (28) and Zucker (42) led to the identification of the active principle ("serotonin") as 5-hydroxytryptamine. Almost all of this powerful vasoconstrictor in the blood is carried by the platelets. So far, however, its role in the mech-

anism of spontaneous hemostasis is uncertain. Trials of this substance as a hemostatic agent have not as yet been rewarding.

In man, the number of platelets has been determined most often on cutaneous or venous blood from the arm. There are significant differences between platelet counts done almost simultaneously on venous and cutaneous blood (35). The mean values obtained in a group of normal young male adults follow:

Cutaneous blood	250,000 (S.D. = 58,500)
Venous blood	310,000 (S.D. = 110,750)
Arterial blood	350,000 (S.D. = 128,000)

The life-span of platelets in the circulation appears to be between three and five days. This is approximately the interval of time required for platelets to reach a normal number in the blood of the dog, rabbit, guinea pig and man, after the first signs of regeneration appear, following a spontaneous or experimental thrombocytopenia. Odell, Tausche and Furth (26) estimated the life-span of Carbon-14 or Sulphur-35 labeled platelets, in the circulation of rats, as six days. Platelets transfused into thrombocytopenic patients, or into dogs with experimental thrombocytopenia produced with antiplatelet serum (40) lasted only a few hours. If the thrombocytopenia is the result of aplasia or hypoplasia of the bone marrow, the injected platelets last longer in the patient's circulation (29).

FUNCTIONS OF PLATELETS

Now that we have some idea of what a platelet is like, let us consider some of its functions. Platelets seem to play a role in the:

1. Inception of blood clotting.
2. Enhancement of clot retraction.
3. Bringing about of spontaneous hemostasis.

There are probably other not so clearly defined functions, but the above seem generally accepted. A consideration of the role of platelets in these functions will enable us to understand why a failure or exaggeration of their activity may lead to excessive bleeding or thrombosis.

Platelets and the Inception of Clotting

The coagulation of blood may be divided into three phases: (a) Inception, or the formation of *plasma thromboplastin*, (b) Progression, or the formation of *thrombin*, and (c) Completion, or the formation of *fibrin*. Platelets contribute principally to the inception phase of clotting by aiding the formation of plasma thromboplastin. Upon shedding of blood, or on contact with certain surfaces, platelets disintegrate and liberate a cephalin-like factor which, when combined with its cofactor in the plasma, forms plasma thromboplastin. Recent work (24a) indicates that this platelet factor is phosphatidyl ethanolamine and is similar or identical in action and chemical composition to the "cephalin" accelerator, long known to be extractable from brain.

Whether or not the platelet factor will combine with its plasma cofactor seems to be influenced by an inhibitor which we have designated antithromboplastin (39). This inhibitor present in the plasma and in many tissues in

TABLE I

COMPONENTS AND EVOLUTION OF PLASMA THROMBOPLASTIN

A. Components:
   1. Platelet lipid factor (in platelets)
   2. Platelet cofactor/lipid inhibitor* conjugate (in plasma)
B. Evolution:
   1. Contact with injuring surfaces
      a) Disruption of platelets, freeing of platelet lipid.
      b) Dissociation of plasma cofactor/inhibitor conjugate.
   2. Platelet lipid + (cofactor/inhibitor) conjugate $\rightleftarrows$ Platelet lipid/cofactor conjugate† + free lipid inhibitor

* Antithromboplastin.

† Plasma thromboplastin.

the form of a lipoprotein, interferes with the formation of thromboplastin perhaps even more than it blocks the action of formed thromboplastin. It is most efficient as an inhibitor when mixed with the blood or plasma before any contact has occurred with disturbing surfaces. In Table I is an outline of the probable mode of interaction of these factors in the formation of plasma thromboplastin (39).

It follows from these and other considerations that a defect in the rate of formation of plasma thromboplastin may result from one of three principal causes:

a) *Diminution, absence or a qualitative defect in the platelets.*

A simple diminution in the number of platelets will slow the rate of conversion of prothrombin, but since a great excess normally exists in the blood, even 10,000 platelets per cu. mm. will provide sufficient platelet material for thromboplastin generation; moreover, since only a small amount of thrombin is needed to start coagulation, thrombocytopenia, per se, will seldom delay significantly the rate of blood coagulation, especially in glass. When platelets are virtually absent, however, (as after acute total body irradiation) elaboration of plasma thromboplastin is negligible and plasma antithromboplastin becomes relatively and, sometimes, absolutely increased (37). In acutely irradiated dogs, this leads to a hemophilia-like disorder which responds readily to platelet-rich plasma transfusions.

Recently Holburn and coworkers (15) have found a family of hemophilics with the characteristic hemophilic hereditary pattern, in whom the prolonged coagulation of the blood seems to be due to a qualitative defect in the platelets (Fig. 1). Morphologically, the platelets appear normal but seem to lack a sufficient amount of the cephalin-like accelerator. The plasma of these patients behaves like normal plasma. This finding has rekindled our interest in the old theory of the causation of hemophilia, first proposed by Fonio (9), and once maintained by Minot and Lee (23), that the platelets were at fault. At least one type of hemophilia may owe its defect to this cause.

b) *Disproportionate increase in the lipid inhibitor (antithromboplastin) conjugated with the plasma cofactor of platelets.*

When such excesses are present, the amount of platelet material available is insufficient to overcome the excess of inhibitor. The interaction of platelet lipid and its plasma cofactor is thereby prevented or greatly slowed. Little or no plasma thromboplastin is, therefore, formed. This seems to be the fundamental defect in the blood of patients with Hemophilia "A", the commonest type of hemophilia, at least in this country. Various degrees of excess of antithromboplastin activity above normal account for the different degrees of severity of hemophilia (39). Normal individuals may, on occasion, develop excesses of this lipid inhibitor, through mechanisms as yet obscure. The blood of such patients is indistinguishable from that of hemophilia A blood.

c) *Disproportionate decrease in the plasma cofactor with which the lipid inhibitor is conjugated.*

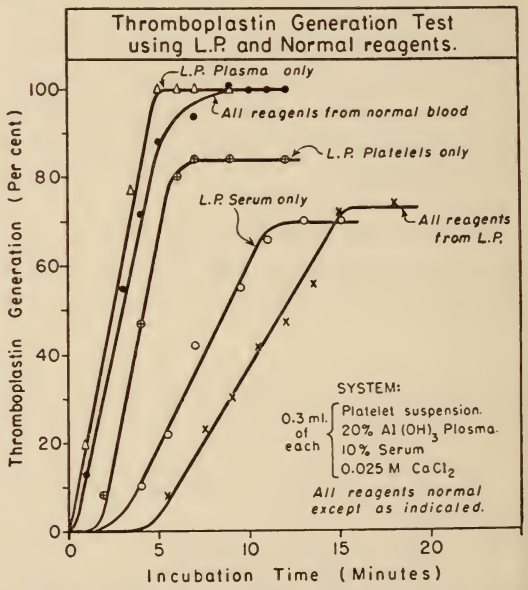

FIG. 1. The platelets and the serum of L. P., the patient with hereditary hemophilia, are insufficient to generate thromboplastin activity when compared to normal platelets and plasma.

This seems to constitute the defect in the blood of patients with Hemophilia "B" (PTC deficiency). Such patients make up about one fifth of the hemophilics observed in this country.

It also follows from these remarks that various combinations of the above defects might be expected to exist and give rise to puzzling findings. We have observed such combinations and others have been reported (19). A deficiency of plasma cofactor and an excess of antithromboplastin present together, would result in a defect especially resistant to blood transfusions. Occasionally, certain defects (hypoprothrombinemia, hypoacceleremia) may, during a bleeding phase, be superimposed on the others already mentioned, making for a very trying situation.

In Figure 2 is shown the effect of the addition of normal platelets on the coagulation of normal and Hemophilic "A" and "B" plasmas. Platelets seem relatively more effective in accelerating coagulation of normal plasma than Hemophilia "A" plasma, and even less, that of Hemophilia "B" plasma. Diluting the plasmas before addition of the platelets, enhances their activity, but does little to improve their action when tested on Hemophilia "B" plasmas. This is interpreted to mean that if a sufficiently large number of platelets is added to *diluted* Hemophilia "A" plasma that its rate of coagulation tends to reach normal. Eagle (7) has shown that hemophilic prothrombin may be made to change normally into thrombin by the addition of an excess of normal or hemophilic platelets.

There seems to be a reciprocal antagonism between platelets and antithromboplastin. This is illustrated in Figures 3 and 4. When platelets are added to an artificial anticoagulant plasma, it may be observed that the rate of clotting approaches that of normal when approximately 100 times as many platelets are added to the anticoagulant plasma as to the normal. Conversely, the rate of coagulation of platelet-rich plasma may be made to approach that of thrombocytopenic plasma (Fig. 4) by adding a suitable amount of lipid antithromboplastin to the platelet-rich blood. Moreover, the quantity of the lipid inhibitor, which will increase by 6-fold the rate of clotting of thrombocytopenic blood, will have little or no effect on blood with a normal platelet content (Fig. 5). If a well homogenized suspension of lipid antithromboplastin is injected intravenously into a dog with normal platelet content, a transient, slight prolongation in the rate of coagulation follows. If several days later, the

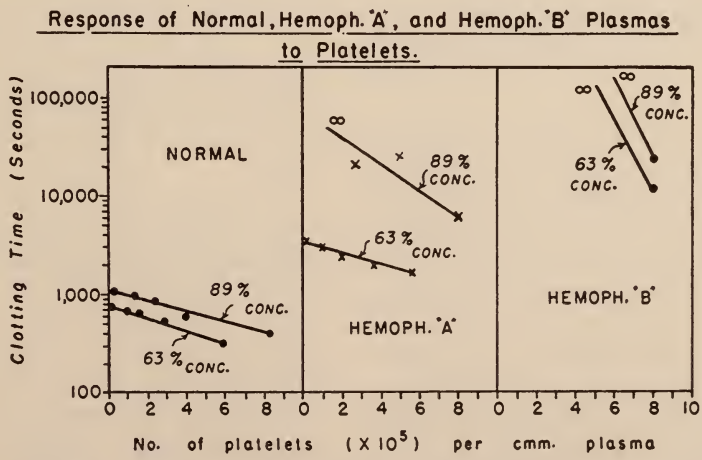

FIG. 2. Testing of the clot accelerating action of platelets at a 63% concentration of the plasma produces faster clotting times, especially in Hemophilia "A" plasmas and less strikingly in normal plasma. When Hemophilia "B" plasma is used, testing of the clot accelerating action of platelets is not affected significantly by changes in the concentration of the plasma.

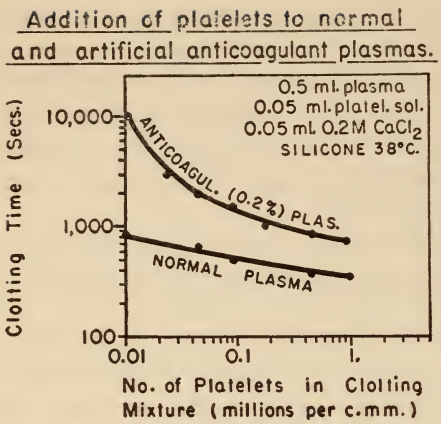

FIG. 3. The anticoagulant plasma was prepared by adding 200 mg. purified lipid antithromboplastin (4a) per 100 ml. of normal human plasma.

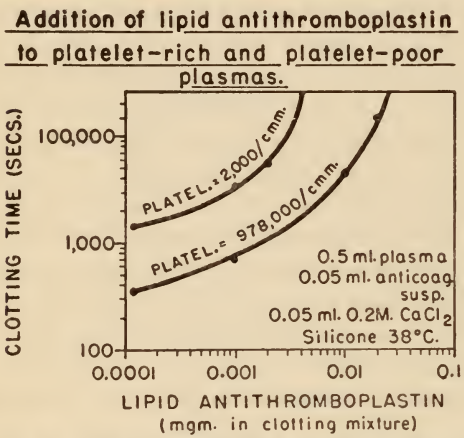

FIG. 4. The lipid inhibitor (4a) is much more effective when added to platelet-poor than to platelet-rich plasma.

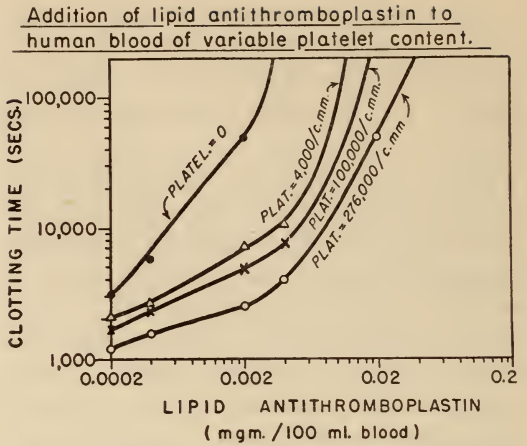

FIG. 5. Specimens of blood were collected from four patients having platelet counts indicated by the figures adjacent to the curves and various amounts of lipid antithromboplastin added.

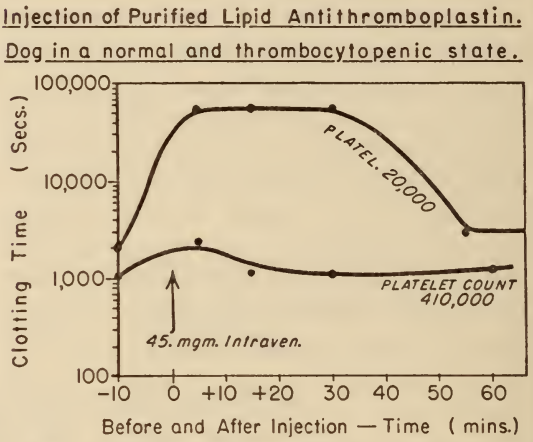

FIG. 6. The thrombocytopenia was produced by injection of 1 cc. antiplatelet serum intraperitoneally 24 hours before the administration of the lipid anticoagulant.

dog is made thrombocytopenic by an injection of antiplatelet serum (32), clotting is markedly delayed, this delay lasting over 30 minutes following the injection (Fig. 6). It seems, therefore, that one of the functions of platelets is to offset the clot delaying action of an inhibitor of the first phase of clotting. If the plasma contains an excess of this inhibitor (as in Hemophilia "A") the platelets, in normal concentration, are insufficient to initiate and accelerate coagulation. Likewise, a great prolongation of the rate of coagulation may appear when platelets are virtually absent from the blood and there is a relative excess of antithromboplastin. These are the conditions in the blood of patients with chronic hypoplastic thrombocytopenias and in animals exposed to high doses of total body irradiation (37).

This antagonistic relationship between platelets and the lipid anticoagulant may be demonstrated when blood from various grades of Hemophilia "A" subjects is injected slowly, immediately after collection, without added anticoagulants into thrombocytopenic individuals and persons with a normal number of platelets. When 300 ml. of blood from "A" Hemophilics of Grade IV was injected into a

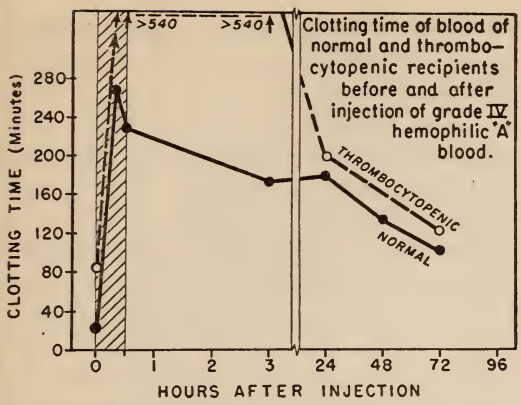

FIG. 7. A significant delay in the clotting time was still detectable as late as 72 hours following the transfusion of Hemophilia "A" blood.

normal person, the venous blood clotting time in glass tubes was delayed from 8 to 138 minutes and in silicone coated tubes from 23 to 268 minutes. When the same volume of this blood was given a thrombocytopenic individual, the venous clotting time in glass was delayed from 14½ to 473 minutes and in silicone from 84 to 540+ minutes (Fig. 7). When 300 ml. of blood from a Grade II hemophilic was injected into a normal individual, the clot delaying effect was negligible. When the same volume of blood was given a thrombocytopenic patient, the venous clotting time in glass was delayed from 18 to 29 minutes and in silicone from 48 to 96 minutes. When blood from a Grade I hemophilic was given to either normal or thrombocytopenic recipients, no significant change followed (4).

Clot Retraction

After blood is allowed to coagulate, the clot will often shrink and draw away from the sides of the vessel. The poor retractility of platelet-free clots was first remarked upon by Hayem (14). If a clot is formed under conditions allowing it a large area of free surface, it will retract moderately even when almost free of platelets. Clots having a large amount of surface exposed to adhesion will retract little or not at all, unless they contain an adequate number of intact platelets (31). There is a highly significant direct correlation between the number of platelets and the degree of clot retraction ($+0.759 \pm 0.024$) (32). Given not unfavorable conditions, blood with an adequate number of platelets may yield an irretractile clot: (a) If most or all of its platelets are destroyed during the first stages of coagulation; (b) If their properties of agglutination and disintegration are defective (thrombocytopathic purpura), or have been modified by physical or chemical agents; (c) If the plasma is so altered as to yield a structureless gel. Efforts to extract from platelets a substance which would induce clot retraction have either been fruitless (36) or remain unconvincing (20).

Observations on slowly coagulating blood make it appear that platelets exert their clot-retraction activity by clumping about the intersections of fibrin needles and forming dense knots. This is followed by bending, twisting and shortening of the needles (34). It is perhaps, while this process is going on, and partly as a result of it, that the clot undergoes the visible reduction in volume.

Platelets and Hemostasis

Platelets share in the mechanism of the spontaneous arrest of bleeding from wounds by:

(a) Massing about defects in the lining of the vessels, especially capillaries and venules (simple platelet massing). This may be the simplest contribution of the blood to the mechanism of hemostasis. It operates at its greatest efficiency in areas where the blood pressure is relatively low, but blood flow is rapid, as for example in the venules and large veins (36a).

(b) Aiding in the formation of the hemostatic plug by virtue of their properties of accelerating the first phase of coagulation and enhancing the stickiness and rigidity of the clot.

The disruption of hemostasis, brought about by the presence of a thrombocytopenia can be readily appreciated by studying the changes produced in an animal to whom a small dose of antiplatelet serum has been administered (33). Thrombocytopenic purpura, thus produced, resembles in most respects its equivalent

in man. Moderate doses of antiplatelet serum produce an attack lasting approximately 48 hours, followed by a spontaneous recovery. Large doses are often fatal, death apparently resulting from massive hemorrhage. The facts so observed helped to strengthen the impression that antibodies against platelets might play a part in thrombocytopenic purpura in man. Harrington and co-workers (12) succeeded in giving the first clear demonstration of the existence of such a thrombocytolytic factor in the blood of some of these patients. Subsequent attempts by various workers to extend these observations to apply to other types of thrombocytopenia have been less convincing.

The naturally occurring thrombocytopenias in man are the result, fundamentally, of defects in the production, delivery or distribution of platelets, or their excessive destruction. From the practical clinical standpoint, in searching for causes of thrombocytopenia, it is well to think of two principal causes, insufficient production, or increased utilization or destruction. As examples of insufficient production are the thrombocytopenias observed in acute and chronic bone marrow failure, due to a variety of causes. As examples of increased utilization or destruction are the thrombocytopenias complicating acute infections (septicemias, bacteriemias) and the exotic disorder called thrombotic thrombocytopenia. In most instances the thrombocytopenia is probably the result of a combination of these causes (increased utilization, diminished production and loss, as through hemorrhage).

Recently it has been pointed out that thrombocytopenia is not uncommon in patients who have received massive transfusions (17) within a short period of time. It was observed in patients who received 5 liters or more of blood within 48 hours. In accounting for this type of thrombocytopenia, one must consider the following factors: (a) The trauma of the operative procedure itself. A reduction in the number of platelets is often observed in the first two days after an operation. In extensive resections lasting several hours this may be a leading factor in patients already anemic and perhaps moderately thrombocytopenic; (b) Partial loss of platelets in the extravasated blood; this applies particularly when blood loss has been such as to require 5,000 or more ml. of blood to be transfused during the operation; (c) Dilution of the platelets in the circulating blood by the often platelet-poor stored blood used for the transfusions; (d) Intra-group incompatibilities between the various units of transfused blood circulating in the patient's vessels; agglutination of red cells resulting from such incompatibilities often sweeps the platelets from the curculation and produces a thrombocytopenia.

The last may perhaps be the most important factor and obviously one of the most difficult to demonstrate and control. The complication is more frequently observed in patients whose platelet production is already impaired before the operation (e.g., cirrhosis of the liver). In those requiring a prolonged surgical procedure, and where the demands for hemostasis, because of the removal or handling of tissue, are excessive, the bleeding may be partially controlled by utilizing fresh blood collected in silicone containers or injected from donor to recipient through silicone-coated syringes. A more satisfactory control of this complication may depend on a more careful cross-matching of the various units of blood given to a patient who has already received multiple transfusions within a short period of time. Platelet suspensions separated from blood collected in sequestrene (5), or especially designed plastic bags (16), may be of temporary help in improving hemostasis.

THE CORTICOSTEROIDS AND THROMBOCYTOPENIA

Up to the advent of corticotropin and the corticosteroids, no drug was known that would stimulate platelet production in patients with idiopathic thrombocytopenic purpura. Spontaneous recovery and temporary remissions from this disease were well known. It is now well recognized that corticotropin, and cortisone and hydrocortisone, and some of the newer corticosteroids may produce a return of the platelet count to normal. This may be lasting, as in the thrombocytopenias of infancy and

childhood, even after the drugs are discontinued, or it may last only while the drug is being given. Even in the latter event, these drugs have proven to be greatly helpful in the preparation of patients for splenectomy. It is seldom, nowadays, that a thrombocytopenic patient has to submit to splenectomy during an acute phase of bleeding. The risk of the operation and its complications has been, therefore, significantly reduced(38).

THROMBOCYTOPATHIC PURPURA

Hemorrhagic diseases have been observed in patients whose blood contains a normal, or nearly normal, number of platelets. By either morphological or functional criteria, such platelets fail to fulfill certain expectations. The term "thrombasthenia" (literally, "weakness of plug") has been used to apply to these disorders. Originally, such a term was used to designate any form of purpura in which the hemostatic plug was defective. This obviously might have been the result of not only changes in the platelets, but also of many of the other blood factors, including prothrombin, fibrinogen and anticoagulants.

Eight different factors have been reported as present in platelets. Each of these represents a certain activity detectable by a special method. Most of them reflect properties of the plasma absorbed by or adsorbed on the platelet. Four properties may be used to guide us in the detection of qualitative abnormalities: (a) Morphological characteristics (size, shape, staining reaction); (b) Clot retraction inducing ability; (c) Agglutinating capacity; (d) Clot accelerating ability (probably due to phosphatidyl ethanolamine); the form of hemophilia already alluded to, may be due to a defect in this factor.

The term "thrombocytopathic purpura" used broadly, designates a hemorrhagic disorder caused by any qualitative abnormality in the platelet. By general consent, however, the term "thrombocytopathic purpura" is now looked upon as designating a disorder manifested by abnormal morphological characteristics of platelets, and partial or complete inability of promoting clot retraction. Patients with this disorder have a constantly prolonged skin bleeding time, a normal venous blood clotting time and absent or impaired retraction of the clot. In most instances, the hemorrhagic disorder is not severely disabling. Because of the close resemblance, clinically, to thrombocytopenic purpura, these patients are occasionally splenectomized, a procedure which does not affect the course of the disease significantly. Direct blood transfusion of fresh, normal blood is effective in temporarily correcting the hemostatic defect.

PLATELETS AND THROMBOEMBOLIC DISEASE

The original studies of Bizzozero (3) and Eberth and Schimmelbusch (8) on the formation of thrombi in living vessels, clearly showed that platelets are intimately involved in this process. Several factors are, however, necessary for the production of thrombosis of the larger vessels encountered after injuries or postoperatively: stasis of the circulation, changes in the vascular wall and local agglutination of platelets. The actual initiating step in the laying down of the thrombus is the agglutination, viscous transformation and adhesion of platelets to the vessel wall. Again we see that those fundamental properties of platelets which endow them with the ability to enhance hemostasis, are the very same properties which contribute to the formation and extension of thrombi.

Thromboembolic phenomena are a complication of many diseases and are observed after operative procedures, particularly those involving large areas of tissue and long periods of relative immobilization. Certain changes in the blood have been observed to follow these procedures. Trauma to the tissues, with absorption of the products of tissue destruction, is perhaps the stimulus for the thrombocytosis and other plasma changes which reach their peak between the sixth and tenth days after an operation. Clinical evidence of the thrombosis probably follows formation of the red or secondary thrombus (18) and may appear only after the platelets have already begun to de-

crease in number in the peripheral blood. The agglutination of platelets into large masses may be facilitated by the entrance of certain micro-organisms into the circulation (10). The platelet clumps that form about these micro-organisms may either lodge in the capillaries or, in the presence of circulatory stasis, in a large vein, gradually building up a thrombus (11). A progressively increasing agglutination of platelets is promoted by the presence of some micro-organisms and their by-products. This may be an important contributing factor to the formation of the "marasmic" type of thrombi (41) observed, especially in patients with acute or chronic cardiac insufficiency. These early, little known observations of Welch actually supply the evidence for the rationale of administering anticoagulants to promote the fluidity of the blood in patients with cardiac disease. Another example of a platelet thrombus is that which forms in apposition to the infarcted myocardial wall. This thrombus, almost exclusively made up of platelets, may reach several centimeters in length and thickness. Its formation is again depending upon those fundamental properties of agglutinability, adhesion and viscous transformation characteristic of platelets.

I should like to close this lecture by mentioning a syndrome chiefly involving platelets designated by the term thrombotic thrombocytopenia, which paradoxically manifests itself by disseminated, almost always, irreversible diffuse thrombosis and hemorrhage. The patient bleeds from certain vessels while alternately, or concurrently, other vessels are being obstructed with platelet thrombi. This disorder, the cause of which is poorly understood, was separated in 1925 from other forms of hemorrhagic disease by Moschcowitz (24), who at first thought that the thrombi consisted of agglutinated erythrocytes. The actual nature of the thrombi was recognized by Baehr and coworkers in 1935 (1). The syndrome is often confused with the "hypersplenic" form of thrombocytopenic purpura. The prominence of central nervous system manifestations, the refractory nature of the thrombocytopenia to either corticosteroids or splenectomy, the presence of hemolytic anemia with no evidences of "autoimmune" antibodies, should help in the differentiation of this disorder from other hemorrhagic syndromes.

When Theseus went into the labyrinth to slay the Minotaur, he was given a ball of thread by Ariadne who held one end of it. He unrolled the thread as he walked on, and later found his way back by following the thread. As foretold, about forty years ago, by Frank (9a) the platelet has been Ariadne's thread which has led us a good portion of the way out of the labyrinth of the hemorrhagic diseases.

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The Significance of Transplantability[1]

By Harry S. N. Greene, M.D.[2]

FOLLOWING the demonstration that human cancer possessed the ability to survive and to grow in animals of alien species (1–11), a series of investigations was instituted in an attempt to determine the significance of this property. The investigations to be reported concern its specificity and were designed to answer two questions: First, whether the ability to grow in foreign hosts was limited to cancer or shared by other tissues; and second, whether or not the property represented a general and essential attribute of cancer. The first series of experiments involved the testing of various tissue states and a comparison of their transplantation reactions with those of cancer, while the second group was concerned with the heterotransplantability of a large number of human cancers.

In the first series of investigations, the reactions of normal adult tissue, embryonic tissue, benign tumor tissue and cancer tissue to autologous, homologous, and heterologous transfer were determined. The anterior chamber of the eye and the brain were used as transplantation sites, and although differences in the incidence of takes and rate of growth occurred in individual cases, the basic factors determining the success or failure of transplantation appeared to be identical in both sites. All of the tissues survived autologous transfer (Table I). Adult, embryonic, and cancer tissue grew on homologous transfer, while benign tumors and precancerous states failed to survive, and heterologous transfer was successful only in the case of embryonic tissue and cancer.

Special significance is attached to the fact that precancerous lesions cannot be transplanted to unrelated animals of the same species (homologous transfer), whereas later developmental stages of the same tumor, morphologically characterized as cancer, grow readily. For example, fragments of a rabbit breast papilloma obtained at biopsy are easily transplanted elsewhere in the same host or to other rabbits bearing breast papillomas, but always fail to survive transfer to normal rabbits (12). In contrast, at a later stage of development when the papilloma has advanced to cancer and attained the ability to invade and to metastasize, transfer to normal animals is readily effected. It would appear that growth and development of the papilloma are dependent on factors resident in the natural host or in other animals bearing similar tumors and that such factors are not present in normal animals. Growth, therefore, does not occur in normal animals, but with continued development the tumor becomes independent of these factors and will grow in normal animals. Further, the independence attained is such that species variations as well as individual constitutional differences are no longer barriers to transplantation, and growth occurs on transfer to alien species.

It should be emphasized that comparable phases of dependency and autonomy have been found to distinguish the developmental course of all other animal tumors studied. A comparable investigation of human tumors with autologous and homologous transfers is obviously impossible; but considerable information can be obtained from the transplantation of successive biopsy specimens secured at intervals throughout the period of development. Several experiments of this type have been completed and the results indicate a complete parallelism with the tumors of rabbits and mice. That is, the human tumors were not transplantable to guinea pigs at early stages of development, but they became transplantable during their terminal stages.

[1] Thomas Dent Mütter Lecture LXIX, College of Physicians of Philadelphia, 3 October, 1956.

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TABLE I

THE TRANSPLANTATION REACTIONS OF VARIOUS TISSUE STATES

	Autologous	Homologous	Heterologous
Adult tissue	+	+	−
Embryonic tissue	+	+	+
Benign tumors and precancerous states	+	−	−
Cancer	+	+	+

The ability to grow embryonic organs and tissues on homologous and heterologous transfer is of more than passing interest. The transplants differentiate and organize into funcional structures (13). Thyroidectomized rabbits with transplants of embryonic thyroid maintain a normal serum iodine. Alloxan treated mice cease to excrete sugar after the transfer of embryonic pancreas. Further, bilaterally adrenalectomized guinea pigs have been maintained in health for many months following the transfer of embryonic rabbit adrenals. In the latter cases, death occurred within five days after removal of the transplants.

The embryonic tissues and organs can be transferred to various sites according to need, and by this means relatively inaccessible organs can be made readily accessible. Embryonic stomachs can be transplanted to a subcutaneous site rendering biopsy or other study a simple procedure. This is especially pertinent in the study of carcinogenesis, and it is enhanced by the fact that embryonic tissues are highly susceptible to chemical carcinogens (14).

Other fields of investigation are opened by the heterotransplantability of embryonic tissue (15, 16). One such study at present in operation concerns the action of infectious agents on embryonic tissues of a susceptible species transplanted to a resistant species. For example, the Rous sarcoma virus does not induce neoplasia in the mouse, but, if fragments of embryonic chick tissue are infiltrated with the virus and transplanted to mouse brains, the Rous sarcoma develops in the transplants. It is noteworthy in this connection that human organs and tissues can also be transferred to alien hosts if obtained before the end of the fifth month of gestation. In this manner, human tissues can be made available for experimentation.

The point to be emphasized in the present context is that the property of heterotransplantability is not limited to cancer but is shared by embryonic tissue. Normal adult tissue, benign tumors, precancerous states, chronic granulomata and hyperplastic lesions will not survive heterologous transfer, and the fact of growth in an alien host identifies a tissue as either cancerous or embryonic. In effect, heterotransplantability constitutes a biological test for cancer, for a differentiation between cancer and embryonic tissue is rarely a matter of practical consideration. From a biological point of view, however, the identity of the transplantation reactions of embryonic tissue and cancer is a significant finding and suggests a common factor. Actually, the similarity of the two tissues is not limited to transplantation reactions but is also shown by morphological, biochemical, and immunological comparison. In reality, the only striking difference relates to the fact that in the primary host and in the experimental animal, embryonic tissue undergoes differentiation, while cancer does not. It would appear, therefore, that the step from embryonic tissue to cancer is a relatively short one and probably concerned with the process of differentiation, Accordingly, one of the endeavors of our laboratory has been to inhibit or to modify the differentiation of embryonic transplants in the hope of thus producing a cancer.

In the second series of investigations, a group of 125 different human cancers was subjected to heterologous transplantation (17, 18) (Table II). Sixty-five of the tumors grew in alien species, while 60 failed to survive such transfer. It is apparent, therefore, that although cancer constitutes the only tissue state, other than embryonic, capable of heterotransplantation, not all morphologically diagnosed cancers possess the property of heterotransplantability. It should be emphasized that the

TABLE II

RELATIONSHIP BETWEEN THE RESULTS OF HETEROLOGOUS TRANSFER AND THE FATE OF THE PATIENT

	Heterotranplantable	Non-Heterotransplantable
Dead.....	57 (5.08 mo.)	11 (38.4 mo.)
Living.....	8 (13.8 mo.)	49 (32.8 mo.)

tumors in the series were all cancers from a morphological viewpoint and that no difference in degree of differentiation or organization or in mitotic index distinguished the transplantable and non-transplantable groups.

Although the groups differing in respect to heterotransplantability show no corresponding morphological variations, an investigation of the fate of the patients demonstrates a significant biological difference. Of the 65 patients with heterotransplantable tumors, 57 are dead and 8 living. Five of the living patients are known to have metastasis, one is under treatment for recurrent growth, and only two remain clinically free of tumor. In contrast, only 11 of the 60 patients with non-heterotransplantable tumors are dead, while 49 are still living and as far as can be determined from clinical records are free of disease. There is also a disproportion in the survival periods of the patients in the two groups. The interval between transfer and death averaged five months when the tumor proved to be transplantable, but was increased to 38 months when the tumor proved not to be transplantable. In brief, heterotransplantable tumors are associated with a rapidly fatal course while patients bearing non-heterotransplantable tumors survive for considerable periods of time. It is suggested that a division of tumors on a basis of heterotransplantability signifies different phases of development with the non-transplantable tumors representing early developmental or dependent stages and the transplantable tumors a late or autonomous stage.

Present investigations are concerned with a more precise definition of the relationship between heterotransplantability and immediate prognosis, and while data are still incomplete, a possible interpretation of the findings is that the properties of heterotransplantability and metastasizability are attained simultaneously by the tumor and that in practice, the demonstration that a tumor possesses the ability to grow in an alien species signifies that it has metastasized in the primary host.

From a clinical point of view, heterologous transplantation can be utilized as an aid to the microscope in the diagnosis and prognosis of human cancer. It is also of value in relation to classification for anaplastic human tumors often show a higher degree of differentiation and organization in the heterologous host than is found in the biopsy specimen. However, the major significance of heterologous transplantation lies in its application to cancer research. Human cancers can be grown in laboratory animals and are available for experimental investigations of a type not permissible in man.

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Clinical Evaluation of a Public Health Program to Prevent Coronary Artery Disease[1]

By Marshall E. Groover, M.D., M.P.H.[2]

PRESIDENT SCHEFFEY, Fellows and Guests of the College: It is an honor and a rare privilege to present a Mary Scott Newbold Memorial Lecture before this highly sophisticated group of physicians. Your comments and criticism will be most valuable in planning future work in this field.

For many years, the U. S. Air Force has been interested in the basic science, as well as the clinical aspects of coronary artery disease. This lecture is the evaluation of attempts to reduce the morbidity and mortality from clinical coronary disease among the top executives of the U. S. Air Force. It is of more than normal interest because of the high degree of cooperation displayed by all members of the group.

The evaluation of one's efforts to prevent coronary artery disease is very difficult for several reasons: (1) The pathogenesis of the disease is poorly understood, making it difficult to evaluate the influence of various contributory elements; (2) The natural history of the disease is so highly variable that one is confronted with the problem of determining whether a patient's treatment has influenced the disease or whether the observed changes are the results of processes unrelated to the therapeutic program; (3) Even though excellent statistical studies are available, one finds it difficult to correlate any individual case with a statistical population.

A program designed to prevent this disease should be based on definite scientific facts. Lacking such facts in the realm of coronary arteriosclerosis, one is compelled to develop such a program from a group of clinical impressions, most of which have no scientific basis for their validity. However, many keen and astute clinicians have developed through the years certain rather firm impressions. These impressions today furnish most of the color for our thinking on this subject. They are:

(1) Coronary artery disease is more prevalent among individuals subjected to emotional stress and strain of modern living and is apparently more prevalent in the tense, hyperactive person than in the calm, phlegmatic individual (1, 9).

(2) Repeated chronic infections in some way seem to increase the individual's susceptibility to coronary disease (2, 10).

(3) Coronary disease is more frequently found in those individuals with relative hypercholesterolemia and hyperlipoproteinemia (3–6, 9, 14) than in those with normal blood lipids.

(4) The individuals living on diets low in fats seem to have less coronary disease than those accustomed to relatively high-fat diets (7–9).

(5) Tobacco in some individuals seems to aggravate coronary disease, in that attacks of precordial pain can be brought on by smoking. In others this relationship is less clear (9).

These clinical impressions may be called assumptions or hypotheses. They may have much, little or no scientific data to support them. Regardless of their validity, they are now the only signs of direction available to guide us in starting a prophylactic program for the prevention of clinical coronary disease.

There are many other facets that are being explored, such as:

(1) Virus infections
(2) Endocrine disorders
(3) Allergic manifestations
(4) Vitamin deficiencies

[1] Mary Scott Newbold Lecture LXXIII, College of Physicians of Philadelphia, 7 November 1956.

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(5) Hydrodynamic influences

However, these elements have been purposely ignored in the preparation of this paper for the sake of brevity.

In 1950 the Surgeon General of the Air Force directed that a program be started for the study and prevention of coronary disease among its top executives. The program was based upon these clinical impressions; and the problem was approached by doing annual physical examinations on the group of top executives stationed in the Washington area.

The examination was planned to be meticulous and to include all of the blood chemistry examinations that might detect early evidence of any of the degenerative diseases. These examinations also included certain x-ray examinations and any special procedures that might be indicated at the time of the annual examination.

The history was planned to record, in addition to the usual review of systems, a detailed study of the individual's reaction to his job, domestic life, or any situation the patient considered to be of a stressful nature.

After completing the examination, the physical defects were corrected and special attention given to the problem of eliminating foci of infection. Those individuals thought to be under severe stress or strain from their jobs were discussed with their superiors, and the necessary action taken. In most cases this was done quite promptly, such as change of assignment; in other cases the patients were given assistance in accomplishing their mission. In many cases, however, no action was necessary as the acute situations had passed by the time the physician had been able to evaluate the condition.

Those individuals showing abnormal changes in their blood chemistry, serum cholesterol, lipoprotein patterns, blood sugar, uric acid and so forth, were given individual consideration, and procedures started to correct these abnormalities. Special attention was given to the serum cholesterol, phospholipid, and the lipoprotein pattern. Those with abnormally high values were tested at regular intervals to determine the changing character of their blood lipids, and if consistently elevated, treatment was started, consisting of exercise, diet, and in many cases, thyroid medication. The rationale was that reduction of serum lipids to normal values would in some way reduce the individual's chance of developing acute clinical manifestations of coronary disease.

The normal blood cholesterol was considered to be 200 milligrams percent or less; and the total lipoproteins to be 400 milligrams percent or less. The normal values for the phospholipids were not determined. It will probably be 10.5 milligrams percent or less, but a longer period of observation is necessary before this point can be settled.

It soon became apparent that the serum cholesterol, lipoprotein, and phospholipids fluctuated so widely in some patients, that it was difficult to predict or to select those likely to develop coronary disease in the near future. In spite of this marked fluctuation, in the early days of the study a great deal of enthusiasm developed around the control of the serum cholesterol and lipoproteins by such measures as diet and exercise. Many people found to have abnormally high values were seen to respond almost miraculously to exercise and diet. As time passed we began to see certain patients who would develop rather high peaks in their cholesterol concentration, with a corresponding rise in the lipoproteins, even though they were following the prescribed diet and exercise program.

At first these spurious reports were considered to be laboratory errors and no serious attention was paid to the phenomena. However, in order to reduce this laboratory error to an acceptable degree, blood specimens were sent to three separate laboratories simultaneously. After several months it was quite obvious that the cause of the fluctuation was not in the laboratory. Two of the laboratories were doing recovery experiments, and while their results were as much as twenty percent at variance with each other, the fluctuations were of the same relative magnitude and direction.

While studying the fluctuations in these laboratory reports, two distinct types of hyperlipidemia became apparent. One type, typical of the majority of patients, exhibited little variation in cholesterol or lipoprotein concentration over the months of observation. They respond well to moderate daily exercise, a low-protein, low-fat diet and thyroid medication.

Seventy-six such cases have been discovered. All of these patients continued to maintain serum cholesterol and lipoproteins within normal limits.

The second type of individual shows fluctuations in the cholesterol and lipoproteins without any relation to exercise, diet, or thyroid medication and, as far as could be determined at the time, with no relation to any recorded data. Forty-three such cases are on record. It is possible that more exist in the group, but they have not been discovered to date.

These forty-three patients have certain characteristics in common. They are relatively young, ranging in age from 39 to 48 years. They are efficient, conscientious, hard-driving, apparently healthy individuals, who have attained positions of rank and responsibility out of proportion to that expected by their age.

The fluctuation in serum lipids in this type of case leaves one in a dilemma as to which specimen should be used in attempting to predict the tendency to develop coronary disease.

It was thought at that time that the fluctuations in cholesterol and lipoprotein were caused by dietary violations or failure to adhere to the exercise program. In order to detect these violations, longitudinal charts were kept on those patients showing abnormally high lipid values.

These charts were used to show the cholesterol, lipoproteins, and notations of important information concerning violations of diet, stressful situations and medication. The charts were found to be of great value, not only as an aid to the physician in visualizing the changing picture of the patient from month to month, but were of even greater value in explaining the program to the patient and helping him to understand the problem involved.

Many of the individuals have physicians as members of their family or as close friends. They have developed an intelligent understanding of this disease. They have also been closely associated with members of the Air Force who have succumbed to the disease, and fully realize the value of making this type of study. These charts helped maintain a cooperative spirit among the individuals, as each one was in a sense running an experiment on himself, with the doctor keeping the record and offering guidance.

Several of the patients who had shown these unexplained variations in cholesterol and lipoprotein pattern began to notice that their blood lipids were highest during periods of severe emotional stress. Attempts were then made to study the serum cholesterol in other patients known to be under emotional stress. This met with disappointment in most cases, as all individuals do not react to stress in the same manner. Most persons react in a variety of ways, but usually not with detectable changes in the serum lipids. These patients had such reactions as: *epigastric distress*; the accentuation of *arthritic pains* in the spine or limb joints; *fatigue*, associated with a positive cephalin flocculation test; marked *increases in systolic and diastolic blood pressure*. A few developed vague *precordial pain*. One patient always developed a flareup of a quiescent *dermatitis* each time he was under stress.

However, many of these did show changes in their serum lipids.

Fig. 1 shows the number of reactions to stress that were studied, showing the type of somatic reaction in relationship to the serum lipid change. *Forty-three patients were discovered to have somatic reactions* without evidence of hypercholesterolemia. *Twenty-one patients did show transient hypercholesterolemia* associated with stress phenomena. *A total of sixty-four patients volunteered the information* that they were subjected to an unusual amount of emotional stress. This probably does not represent the true number of persons showing changes in blood lipids while under emotional stress any more than it represents the total number of

	With No Transient Hyper-cholesterolemia	With Hyper-cholesterolemia
Epigastric distress...	11	2
Precordial pain.....	8	8
Fatigue with positive cephalin floc..	8	1
Arthralgia.....	5	0
Hypertension.....	5	1
Dermatitis.....	4	3
Spastic colon, abdominal pain.....	2	0
None detected.....	0	6
Total.....	43	21

FIG. 1. Reaction to emotional stress in relation to job or domestic life.

reactions to stress in the group. It only represents the number of patients who recognized the fact that they were under an unusual amount of emotional stress and volunteered the information. It so happens that blood specimens were taken in only twenty-one of these sixty-four individuals at the opportune moment when transient hypercholesterolemia could be demonstrated.

In order to observe the reaction to stress in a group of this type, several factors must be present:

1. The physician must be in very good rapport with the patient.

2. The patient must be subjected to a stressful situation which is *spontaneous*, as simple fatigue does not seem to produce this type of reaction. It would be difficult to construct an artificial situation comparable to the spontaneous ones observed in this group.

3. The physician must be available at the time, and he must have laboratory facilities for taking and examining the specimens.

4. The stressful situation must be one which the patient feels free to discuss with his physician. It is quite conceivable that many individuals have faced stressful situations which they do not wish to discuss, even with their physician, and this may account for one or two cases showing marked fluctuation with no relation to stress or treatment program.

5. The laboratory determinations, the stressful situation and other pertinent data should be recorded in a manner to make the phenomena intellectually visible.

A study of this type of reaction to emotional stress must be done on the spot, since it cannot be produced artificially, the only way additional data can be obtained is by observing a group of individuals carefully enough to recognize the situation when it occurs.

CASE STUDIES

The following brief case histories are typical examples of the type of patient showing fluctuations in their cholesterol and lipoprotein pattern while under stress.

Case No. 1 is that of a 42-year-old male, the executive officer for his division chief in an overseas station. His boss was developing all the signs and symptoms of cerebral arteriosclerosis. The stress in this instance was a severe one. The patient, with most of his productive life in the Service, was faced with a superior who must make his efficiency report at regular intervals, and at the same time was a person completely unreasonable and actively hostile towards the patient. It so happens that the symptoms subsided soon after a physician sent the patient's boss to the hospital. The chart of his case shows a remarkable increase in his serum cholesterol during the period of stress before his superior officer developed symptoms severe enough to require hospitalization. There was a remarkable drop in the serum cholesterol during the five-months period after the patient's boss was retired from the Service. No lipoprotein studies were done at this time. This patient shows only changes in his serum cholesterol. He was apparently well for three and one-half years when he developed a fatal myocardial infarct. The circumstances immediately preceding his fatal episode are unknown. His diet and reaction to stress were not recorded.

Case No. 2 is a 45-year-old male, first seen because of a suspected myocardial infarct. He was thought to be one of those commonly referred to as idiopathic hypercholesterolemia. His serum cholesterol average varied from 400 to 550 milligrams per cent. After his wife left the station, his domestic stress was removed. The serum cholesterol remained elevated for approximately six months after this, then gradually returned to normal levels. Approximately two years after his serum cholesterol returned to normal, he suffered an acute myocardial infarct, from which he apparently made a complete recovery. Eighteen months later he developed a fatal myocardial infarct. This patient was on a rigid low-fat diet during the entire period of observation. The character of his diet during the six months prior to the first infarct is not known. One wonders whether the removal of stress was responsible for the change in serum cholesterol, or whether it was

the prolonged effect of low-fat diet. There is a question of whether this person was subject to other periods of stress which are not recorded in this diagram.

Case No. 3 is a 49-year-old male who was subjected to rather severe political stress. His reaction on some occasions was one just short of rage. The severe stress lasted for about two months and gradually decreased. During this period his cholesterol and total lipoproteins increased approximately one hundred per cent and returned, after the period of stress, to normal values. He had experienced an acute myocardial infarct four years prior to this period, but no evidence of a new infarct could be detected, even though he had three attacks of auricular fibrillation during the first period of stress. This patient seemed to have many recurring stressful episodes during the next two years. The second severe period of stress was in 1955, when an increase was demonstrated in cholesterol and in the lipoproteins. He was existing on a relatively low-fat diet during the entire period covered in this study.

Case No. 4 is a 47-year-old white male who was subjected to a peculiar type of emotional stress, resulting in a combination of fatigue, resentment and at times of acute anger. The cholesterol and lipoprotein fraction seemed to be falling in response to his diet, to which he was adhering fairly consistently. He was hospitalized for minor surgery, and approximately two weeks after leaving the hospital developed an acute myocardial infarct. He was retired; and during the process of his retirement many small irritating episodes developed. The highest lipoprotein value, shown at the end of 1955, was taken several hours after a stressful situation which produced an outstanding rage reaction. Along with this, he had precordial pain intermittently for the next two days, which was the first pain he had experienced in three months.

This patient showed an interesting phenomenon, during the last three months of 1955. It seemed that almost daily some small crisis was added to his worries. All of his stressful situations were severe enough to have irritated any normal person. This patient, however, seemed to react more vigorously than a normal man would be expected to react to similar stimuli. The lipoproteins seemed to show a greater fluctuation in response to stress in this case than the total serum cholesterol.

Case No. 5 is a 49-year-old male, who was known to have an acute myocardial infarct in 1950. From that time until 1953, no laboratory reports of cholesterol determination were available. He was given a job during this period that was considered to be free of emotional strain and stress. He was completely asymptomatic during this period. In 1953 he was transferred to one of the hottest spots in the Service. His serum cholesterol and lipoproteins were seen to gradually increase, apparently in direct proportion to the amount of stress to which he was subjected. In addition to the stress of his job, a personality clash developed which reached the climax in August of 1954, at which time a marked increase in serum cholesterol and lipoproteins occurred. According to the patient, things improved considerably after this time, and his physician began to feel happy about the situation. At this time he began to have recurrent subcutaneous abscesses which were treated with antibiotics.

His official duties required that he make a trip out of the country, and during this trip he lost a good deal of sleep, violated his diet completely, and became thoroughly exhausted. After approximately one day of rest, he developed an acute myocardial infarct. Serum cholesterol determinations were done twice during this period: 390 and 374 milligrams per cent. Since returning to the United States he has been free from stress and has observed a strict, fat-free diet.

Case No. 6 is that of a 49-year-old General officer, who was transferred from field duties to Headquarters in 1952. At the time of his annual physical examination in 1952, his serum cholesterol was considered to be normal. The duty assignment was one of those jobs requiring the patient to coordinate certain activities with the other two major services. The activities were in a field of vital importance, and one requiring the reconciliation of opposing basic concepts. He was constantly working to meet deadlines, and almost as constantly failing to meet them. On top of this situation, and perhaps as a result of the situation, certain personality conflicts developed. The peak of emotional conflicts developed in October and November of 1953, and again in 1954. With each period of emotional conflict, marked increases in serum cholesterol and lipoproteins were observed, even though he continued to adhere to a strict vegetarian type of diet.

This individual was a serious and very conscientious type of person before his transfer to the Washington area; and several months later he became tense, relaxed with difficulty, and was considered very irritable. A change of duty assignment occurred in early 1955, and the blood chemistry seems to have improved. This patient was on a low-fat diet, with occasional violations, during the last half of 1953 and all of 1954 and 1955. There has been no clinical or laboratory evidence of coronary artery disease in this patient. Here again, the lipoproteins seem to show the effect of emotional stress to a greater degree than does the serum cholesterol.

Two additional cases showed an increase in their cholesterol and lipoproteins after assuming responsibility of a new job. No definite emotional stress or strain occurred, other than that of learning a new job.

Several patients exhibited changes in their serum cholesterol, lipoprotein and phospholipid pattern that could not be definitely related to emotional conflicts, variations in diet, or to drug therapy. Two of these patients had recurrent, chronic infections. The fluc-

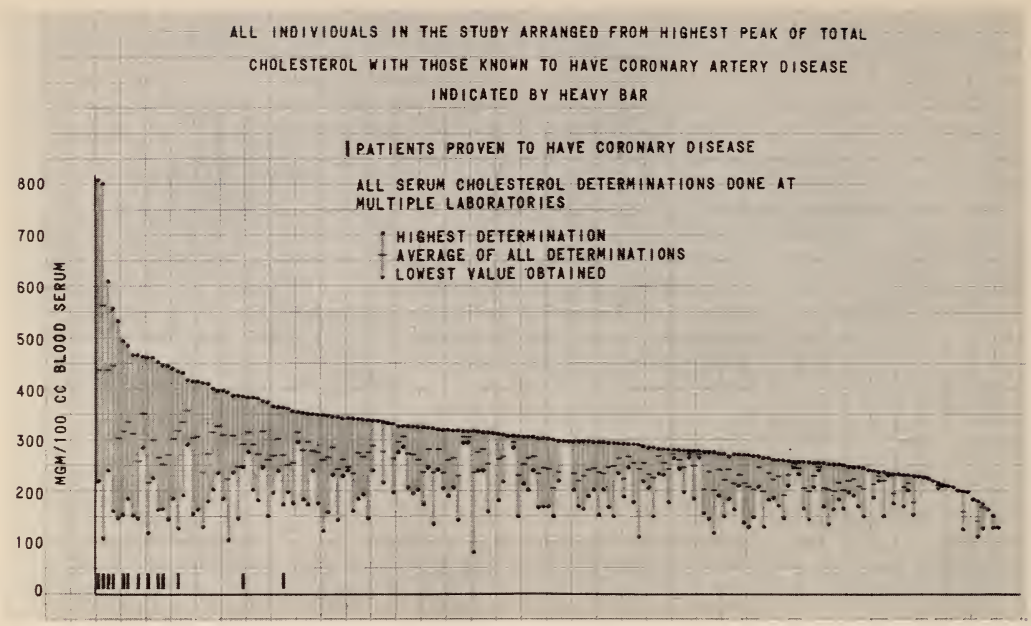

Fig. 2

tuations in the serum lipids seem to be greatest in their −20 to −400 lipoprotein fraction. These patients feel that the fluctuations observed may well be the results of multiple minor stressful situations, which suddenly appear, and disappear with equal rapidity. These patients all show little fluctuation in their serum cholesterol, compared to the rather violent changes seen in the lipoprotein pattern.

Case No. 7 is that of a General officer, 47 years of age, who is one of the patients considered to have idiopathic hypercholesterolemia with xanthoma of the eyelids. His cholesterol has fluctuated from a high of 670 milligrams per cent to a low of 380 for several years prior to 1953. He was placed on a strict vegetarian diet and given sitosterol and thyroid, with no significant improvement until he was started on estrogen therapy, which appears to be of some value. The value of this cannot be certain, however, until he has had at least a year of observation. Some of these patients seem to show an excellent response to estrogen therapy for the first three or four months. Later the serum lipids return to the previous high values when estrogen dosage is reduced to a tolerated level.

Since all of the individuals who have developed coronary artery disease in this group have shown rather marked fluctuations in their serum cholesterol and lipoprotein values or have had sustained high cholesterol and lipoprotein values, it was decided to arrange the individuals in the group according to the average of all their serum cholesterol determinations and to compare this with an arrangement showing the same individuals according to their peak value of serum cholesterol obtained during their period of observation.

Figure 2 shows the same individuals arranged according to the peak of their serum cholesterol value. Those patients proven to have coronary artery disease were indicated by the heavy bars beneath the graph. One can see from inspection that the incidence of coronary disease appears to be much greater as the fluctuation in cholesterol increases. It is interesting to note that many patients with coronary artery disease have had low serum cholesterol at certain times. Their distinguishing characteristic seems to be the degree of fluctuation. In some of these cases the fluctuation is shown to be associated with emotional stress. The fluctuations are seen in the elements *cholesterol*, *phospholipids*, and *lipoproteins*. While the −12 to −20 fraction appears to fluctuate less than the 0 to −12, or the −20 to −400, these fluctuations are unpredictable, so that it is extremely difficult to predict with certainty those individuals destined to develop coronary artery disease on the

basis of any one laboratory determination. Throughout the period of observation, one is impressed with the prevalence of cases of clinical coronary disease in those individuals showing relatively high peaks of serum cholesterol. This is not apparent in the lipoprotein fractions or in the phospholipid determinations; and from inspecting tabulations of cases, it is quite obvious that the peak value of serum cholesterol is much more likely to select those cases destined to develop coronary disease in the near future than any other serum lipid studies.

However, when studying reactions to emotional stress, one is impressed with the fact that changes in serum lipids are reflected in the lipoproteins much more rapidly than in serum cholesterol. Because of the marked variation in individual's response to stress and the possibility that other factors may influence these changes, one is not justified in attempting to draw conclusions from a statistical study of the few cases observed in this study.

Twenty-one individuals in this group have shown fluctuations in their serum cholesterol and lipoprotein pattern in response to emotional stress and strain. It must be kept in mind that there is no way of measuring this type of stress, and the patient's history is the only source for determining the degree and duration of the stressful situation. The manner in which this information was obtained is subject to some criticism as the patients were asked for their opinion as to the explanations of the fluctuations observed.

The stressful situation in some cases had passed before the information was placed upon the patient's chart. In this respect the chart is subject to the inaccuracy inherent in the patient's memory. It is certainly possible that any person could relate certain phenomena to emotional stress if the phenomena were intellectually visible. Also, the fact that these patients were given time to recall their past experience and to decide the amount of stress produced by any given situation allows for a certain amount of unconscious fabrication by the patient.

While this is exactly what has happened in this study, the patients are all considered to be intelligent and intellectually honest. There is also no motive for conscious misrepresentation of the facts, other than the desire to find a cause of the observed changes in blood lipids.

During the past 18 months it has been possible to record the stressful episodes before laboratory reports were available to either the physician or the patient. The same response has been observed with this method as when the correlations were done in retrospect.

It must be remembered when comparing these patients with other studies that practically every individual has had to meet rather strict physical requirements during his military life. They have been subject to annual physical examinations; they have been advised to partake of a fat-free diet, to take regular daily exercise, and in many instances have been given clinical trials of various drugs in order to decrease the serum cholesterol. *The fluctuations noted may be the results of stress in an individual who is under treatment* and may not be apparent in an untreated population.

Figure 3 is a tabulation of all the cases of clinical coronary disease occurring in the group during the past five years. In the group of individuals under study there have been nineteen cases of coronary disease, *six fatal cases* and *thirteen non-fatal.* Autopsy study of the fatal cases shows the typical atheromatous lesions. The thirteen cases are well documented by *clinincal, laboratory and electrocardiographic findings.* Six of the cases were not studied in this program, and no record is available of their response to stress. The history in each case is that of having gone through a stressful period and was relaxing when the infarction occurred.

Of the fourteen cases studied in the program, *ten cases* show definite changes in their cholesterol and lipoprotein concentration while under stress and a return to normal values after the stress period had passed. In two of these cases there was definitely no response to stress, as their serum lipids were continuously elevated. *In three,* marked fluctuations were

	Hist. of Infec.	Hist. of Stress Recog.	Hyper Choles-terol-emia of Stress	Response of Prophy-lactic Program	Liv-ing	Dead
#1 RO 1	+	+	+	Good	+	
#2 UN	−	−	−	No. E	+	
#3 NI	+	+	+	Good	+	
#4 MC	−	−	?	No. E	+	
#5 BO	+	+	+	Good	+	
#6 LE	+	+	+	No	+	
#7 CR	+	+	+	Good	+	
#8 BE	+	+	?	Good	+	
#9 RA	+	+	+	Good	+	
#10 TA	+	+	+	Good	+	
#11 KE 1	+	+	?	Good	+	
#12 LA	−	+	+	?	+	
#13 KE 2	+	+	NR	?		+
#14 VI	+	+	NR	—		+
#15 SM	+	+	NR	—		+
#16 RO 2	+	+	NR	—		+
#17 NO	?	+	NR	—	+	
#18 CO	+	+	+	+ Lost		+
#19 GR	−	+	+	+ Lost		+

FIG. 3. Individuals having had one or more myocardial infarcts.

seen, but the relationship to stress could not be established, and in one case, no laboratory facilities were available at the time of his greatest stress.

In all six of the fatal cases, a definite history of unusual stress was obtained from friends or close associates. The accuracy of these histories will always be subject to question, as the inaccuracies of individual memories are well known.

The phenomena observed in these patients seems to indicate that stress, so often mentioned in the literature and in the textbooks, may be part of the mechanism producing the metabolic disorder, transient hypercholesterolemia and coronary atheroma. If this is the case, attempts to prevent coronary disease should be directed toward discovering those individuals who develop transient hypercholesterolemia while under stress, placing them in positions of relatively less emotional stress. Another approach would be that of preventing the stress reaction in these patients by perhaps one of the tranquilizing agents, estrogens, testosterone, or other biologically active substance.

Granted that measures directed to maintain normal serum cholesterol values may not correct the basic metabolic defect, it *is* possible that the rapidity of the process may be retarded. Milch (5) has shown that the amount of radioactive cholesterol in the wall of the aorta of animals parallels that of the serum, and that the uptake of cholesterol by the coronary artery is approximately twice that of the aorta. One may assume that the presence of cholesterol in the arterial wall is part of the disease.

Whether this assumption is true or false, one is justified in continuing efforts to reduce serum lipid values until more scientific means of preventing this type of heart disease become available. At the present time, attempts to reduce serum cholesterol, phospholipid and lipoprotein values have met with varied results.

Many therapeutic agents have been given credit for ability to decrease the serum cholesterol (12, 13, 8). A few have been tried in this group of individuals. The interpretation of results is extremely difficult because of the marked individual differences in their response. One is never sure whether the changes noted here are the results of medication or the results of other factors.

Fig. 4 is a tabulation of the results obtained in selected individual cases. The difficulty one has in evaluating the results of such drugs is obvious from the inspection of this table. These cases were selected to show the best response and the least response recorded. The tabulation is prepared in order to illustrate the varying effects one might encounter when studying the action of various drugs on the serum lipids of a group of individuals. When a drug produces a good response in an individual, the response may be miraculous, but there is no way of predicting before the clinical trial how a given case will react.

At this time, one can be fairly sure of reducing blood cholesterol and lipoproteins to normal values in this particular group of individuals by the following combination:

1. Exercise
2. Fat-free diet

Drug Used and Dose	No. of Patients	Response in Terms of % Change from Original Value	Duration of Treatment
ACTH gel. 60 units 3× week	1	−18	7 months
	2	−23	5 months
	3	−20	8 months
	4	+7	2 months
	5	−38	3 months
	6	−26	4 months
Cortisone 25 mgm 3× day	1	−5	1 month
	2	+80	1 month
	3	+19	1 month
	4	−18	2 months
	5	−26	2 months
Cytellin 60 cc before meals	1	+12	3 months
	2	−22	6 months
	3	−17	5 months
	4	−20	6 months
	5	−41	4 months
	6	−19	4 months
Thyroid 4 grains daily	1	−102%	18 months
	2	−80%	13 months
	3	−60%	7 months
	4	−58%	6 months
	5	+11%	3 months
Ethinyl estradiol .5 mgm daily	1	−140%	17 months
	2	−29%	4 months
	3	−80%	7 months
	4	+40%	2 months

FIG. 4. Observed change in serum cholesterol

3. Thyroid therapy
4. Estrogen therapy
5. Elimination of emotional stress.

The above combination seems to be effective in the majority of patients with hypercholesterolemia. The dose of thyroid and estrogen has to be worked out with each patient. The problem is that of finding the smallest effective dose of each drug. Adenosine-5-monophosphate seems to be of value, but more experience with this preparation is necessary before its value can be definitely established.

DISCUSSION

Nineteen cases of coronary disease have developed during the five years this program has been in operation. Six deaths occurred in individuals not actively engaged in the prophylactic program. Two of them had left the area and were lost until their coronary disease became symptomatic. One patient decided that he did not wish to participate. And three were individuals who were never studied long enough to determine their need for the program.

The aims of the program have been threefold:

First: Education of the group to take regular exercise and reduce the fat content of their diet.

Second: Teaching the effect of stress and the need for eliminating the stressful reaction from their daily lives.

Third: Control of the abnormal blood chemistry by exercise, diet, and drugs, explaining the need for frequent visits to the physician to follow the changes in their blood chemistry.

This program has certainly accomplished Item 1 in that the value of exercise and diet has been impressed upon them clearly.

Item 2 seems to have been equally well covered by the study of their individual charts and graphs and by having had blood specimens drawn at recurring intervals, all of which serve to stimulate interest in the program, by producing a better understanding of the effects of stress upon their lives.

Item 3 has been accomplished to a certain degree in that the great majority of individuals have been able to bring their serum lipid fractions to the normal range by regular exercise and diet. A few patients required the addition of thyroid medication to this regimen.

At least twenty-one did not respond satisfactorily to this regimen and were found to react to emotional stress and strain by abnormal lipids which returned to normal after the period of stress had passed.

Some of these patients have been found to respond to Adenosine-5-monophosphate and to estrogens. The Adenosine-5-monophosphate is used in three daily doses of 200 milligrams each, and the estrogen dosage varies from .02 to .5 milligrams a day of ethinyl estradiol.

Those patients with so-called idiopathic

hypercholesterolemia, showing a continuous high serum lipid content, have been seen to respond, at least temporarily, to estrogen and to Adenosine-5-monophosphate. The final evaluation of these drugs will have to wait for several years before their true worth can be definitely established.

The important part of this program is the information obtained from the group of individuals subject to emotional stress and strain.

The fact that the serum lipids seem to fluctuate very rapidly in some individuals in response to emotional stress suggests the *dynamic* nature of the basic metabolic disorder. Apparently, certain individuals have inherited the metabolic makeup which allows them to respond to emotional stress by increasing their serum lipid concentration. In one group this change in the lipid metabolism appears to be the result of an endocrine imbalance or perhaps a defect in certain enzyme systems. The majority of individuals develop an increase in serum lipids because of a combination of physical inactivity and hyperalimentation.

If this metabolic defect is reversible, and it appears to be, then early recognition and treatment may be the answer to the prevention of coronary disease in this type of patient.

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Faith and Healing[1]

By Reverend Ernest Gordon[2]

FOR some reason or other the practice of medicine and the ministry of the Church seem to have parted company with each other and gone their separate ways. The responsibility for this division cannot be placed solely upon the shoulders of Medicine or the Church but must be shared by both. Clergymen as a whole have tended to look upon healing as the business of physicians, and physicians have looked upon faith as being the sole province of the Church. Both clergymen and doctors have forgotten that, in the Western world such as we know it, the practice of medicine is something which was once a very important concern of the Church. Indeed, I would go as far as to say that *Aesculapius* was converted to Christianity and supported by the Church until fairly contemporary times. From any point of view this division is obviously an error, for faith and the healing process are not in opposition but integral to one another. By the use of drugs or surgery the doctor allies himself with God's healing forces and aids their operation. Similarly, the clergyman allies himself with the spiritual power that God alone can give, and through his ministry helps to channel this power into the lives of those in need.

At the very start I would like to stress the fact that the Biblical view of man presents him as a trichotomy, that is, as a body and mind kept in harmony or integration by the spirit. Although he is a trichotomy, he is indivisible; he is an essential unity. Nowhere is this unity preserved more effectively or strongly than in the Bible or in Christian teaching as a whole. In Old Testament times, spiritual, moral, mental and physical health went hand in hand. The priest had the responsibility of caring for the whole man, of assuring him of God's forgiveness, and of healing his diseases with whatever resources that were available. I need hardly remind you that the Hebrew priests were extremely concerned about the health of their people, or that the book of Leviticus is probably one of the best documents in preventive medicine ever written.

The Christian contention is that through the birth of Jesus, God tabernacled Himself in the flesh and brought His Kingdom within the reach of mankind. When John the Baptist heard of the work Jesus was doing he sent his disciples to inquire of Him thus, "Are you he who is to come, or shall we look for another?" The reply given them was, "Go and tell John what you have seen and heard: the blind receive their sight, the lame walk, lepers are cleansed, and deaf hear, the dead are raised up, the poor have good news preached to them. And blessed is he who takes no offense at me."

These are the signs of the Kingdom of God in the midst of men. The healing of diseases and injuries you will note is heavily underlined. Healing was such an obvious part of Jesus' ministry that I need not remind you of it; the miracles are reported for our evidence on this score. One of the interesting things about these healing miracles, by the way, is the fact that His enemies admit that they had taken place. The Talmud, for instance, does not deny that Jesus did signs and wonders, but rather tries to explain them as acts of sorcery.[3] You will remember that the Pharisees accused Jesus of performing miracles by the power of the Prince of the underworld. That He did perform healing miracles as well as

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[3] Cf. Josephus Antiquities XVIII 3, 3, pp. 63–64. "About the same time came Jesus, a wise man, if indeed we should call him a man. For he was a doer of miracles and the master of men who receive the truth with joy."

others, I would postulate as a well documented fact.

It was as the master physician that Jesus commanded His disciples to go forth into the world to proclaim the advent of the Kingdom of God and to prove it by their power over demons and by their ability to heal. When He sent out the Twelve as apostles of the Kingdom He, "gave them power and authority over all demons and to cure diseases, and He sent them out to preach the Kingdom of God and to heal".

In His instructions to the seventy of their mission the command of Jesus was, "Heal the sick . . . and say to them, The Kingdom of God has come near to you." Finally, in His commissioning of His disciples just prior to His ascension He said, "And these signs will accompany those who believe: in my name they will cast out demons, they will speak in new tongues, they will pick up serpents, and if they drink any deadly thing, it will not hurt them; they will lay their hands on the sick, and they will recover."

This healing ministry was continued in the apostolic times and if it has been ignored in our day the blame is entirely our own.

My attention was first drawn to the need for faith in healing by certain British medical officers who were prisoners of the Japanese like myself during World War II. As doctors their task was unenviable. Practically every man in the camp was extremely ill by normal standards, yet there were no drugs, no disinfectants, no anesthetics and no surgical apparatus. Our daily diet consisted of twelve ounces of boiled rice flavored with a watery stew made from hibiscus and other leaves. Living was such a difficult business that it was much easier to die—and thousands did. One of their main tasks, the medical officers realized, was that of encouraging men to keep on hoping and to have some kind of faith. Comparatively healthy men died quickly, while others who were shot through with a wide variety of diseases continued to survive beyond all reasonable expectation. At one particular time I, myself, had malaria, amoebic dysentery, beriberi, scabies and polyneuritis caused by untreated diphtheria. The two doctors who were helping me as much as they could eventually gave up hope and were heard to remark, "He isn't long for the road. Try to make his end as easy as possible." Well, as you can see, I am still very solid flesh. It may be that a mistake had been made regarding the ability of my body to survive or it may be that such faith as I possessed was instrumental in making a recovery possible. As far as I am able to judge, however, I am convinced that it was the latter, or at least a combination of both. What was true in my case was also true of others, and it became obvious to me that religious faith made healing possible.

During my eight years in the ministry I have only come across two extreme cases involving direct faith healing. The first came to my attention in Scotland just prior to my departure for the U.S.A. in November 1952. The person in question was a woman suffering from an internal cancer. After an exploratory operation in 1950 the surgeon in question gave as his view that the patient had only about six months, plus or minus, to live. Since this operation she had been confined to bed. During a pastoral call this lady asked me if I believed in faith healing. I replied that I did and that I would get in touch with others who would help her after I left. A ministerial colleague, in consultation with her family physician, came to visit her regularly and to lay his hands upon her. Within a comparatively short time she began to improve. A condition of edema in her legs disappeared and she was able to rise from her bed in order to carry out normal household duties. She continued in apparently good health until three or four months ago when she died. Apart from an improvement in her physical condition there was a change in personality. From a rather houseproud shrew she turned into a very sweet and gracious person. When she died, she did so in peace and without pain. The facts in this case I was able to check during my visit to Scotland this past summer.

In the second case I was more personally involved. A seventeen year old boy in my congregation at Montauk, Long Island, developed

hepatitis; he carried on with his school work and athletics although he felt decidedly unwell. By the time his illness was reported to his family doctor he was in an extremely critical position. The upshot of it all was that it was felt that he could not be cured. Such a remark had been made in the hospital and then passed on to the outside world by nurses living in the community. In one morning I received about six inquiries asking when the funeral was to take place. When I visited the home his mother was completely distraught and I did my best to comfort her. The boy was returned to his home as nothing further could be done for him in the hospital. Shortly after his return I had a consultation with the family and advised them that it might not be God's will for the boy to die. Having explained my views upon the importance of faith in healing, and receiving agreement, I arranged to have a family communion service which was to be followed by the laying on of hands. Within a short time of that service the boy had begun to recover and is now today able to lead a very normal life.

In conclusion, I should like to make a brief summing up:

A) Faith or divine healing should be kept in its place. That place I believe to be within the framework of the Church and in cooperation with practicing physicians. The wrong emphasis such as we see in movements like Christian Science may lead to heresy. Healing is one of the functions of the Church, but not the only or the most important one.

B) There is nothing freakish about the Church's interest in divine healing. It is part of her reconciling ministry done in obedience to the command of Jesus Christ, her Lord. The salvation offered to the world through Christ is that which includes body, mind and spirit. Salvation implies wholeness. By prayers of intercession within the congregation, by prayers for healing at the bedsides of the sick, by special services for healing and by the assurance of God's forgiveness, the Church attempts to fulfill her task.

C) Illness on the part of any particular individual does not imply that it is a punishment for any particular sin. Neither is continued illness the result of sin where divine healing has been administered. With humility we must recognize that such illnesses may be according to the will of God for us. It is often the righteous who suffer and who do so for the glory of God.

D) Faith does not exist in a vacuum, it is centered upon an object or person. For the Christian, faith means the loving trust in God as the loving Father Almighty who has revealed Himself to us through His Son and who wills nothing but good for His children.

E) The Church is not in opposition to the practice of medicine or psychiatry nor is she interested in claiming that the healing of organic diseases always occurs as a result of faith. From the evidence at Lourdes and from elsewhere, it would appear that such healing does take place, but at the same time she recognizes the fallibility of physicians in matters of diagnosis and prognosis.

F) Apart from the healing of physical ailments there is no doubt that religious services of healing do bring peace to the afflicted and ease their pains; usually a noticeable change takes place in personality traits and the patient becomes a much better person.

G) It is to be deplored that so often faith-healing is looked upon as a last resort, the attitude being, "Everything else has failed; let us try God as a last and rather hopeless resort." Any form of sickness or injury should be treated by prayer and medicine. The task of the doctor is made easier when his patient is conscious that he is in God's hands and that he has an inner strength which will help him to get well.

H) My final point is that we fail to take God seriously. Our over concern with the world of nature, the scientific method and the processes of mechanization have made us so earthbound that we have almost lost the faculty of faith and our place in the Universe as the children of God, created in His image and likeness.

St. Luke the Evangelist: A Psychosomatic Prophet[1]

By Nicholas Padis, M.D.[2]

IN ITS ESSENCE evolution is a series of cosmic events shaped to perfection by Time and, according to Hippocrates, Time is the first God.

The history of medicine is a record of the evolution of man's efforts to understand the causes of diseases, how to treat them and, above all, how to prevent them. But these efforts have not fully succeeded in spite of the passage of time. At present most of our medical truths, unfortunately, are only half-truths.

Modern medicine, however, is continuing the search for truth—attempting from every path of knowledge to solve the riddle of human suffering. At this mid-century point many of the old physical and medical concepts are being ventilated with modern scientific thoughts such as the general theory of relativity, the structure of the atom, conditioned reflexes, antibiotics and, most important, the existence of a subconscious labyrinth in the human psyche. But the present is the child of the past. All these startling scientific discoveries were conceived in some related form by men of long ago.

In reality no problem is permanently solved. Paradoxically the apparent solution of any problem just gives birth to more problems. Probably this is the essence of immortality.

The growth of Christianity is one of the marvelous examples of such a paradox. When polytheistic Greece buried her Olympian gods and allowed St. Paul to declare his unknown God, new social, cultural and medical problems were created. Christian philosophy was in many ways contradictory to both the current Hellenistic ideas and those of the old Oriental world. Naturally medicine could not escape the intellectual turmoil for the Gospels were pointing out not only a new way of life, but a new path to freedom from pain, disease and suffering.

Events and personalities are the true channels of ideas. At the time of the rise of Christianity, among the many physicians who struggled in their pagan minds to understand the spiritual forces of this new philosophy of life, was St. Luke the Evangelist, a beloved physician, author of the third Gospel and the Acts, and a prophet of the medical ideas known in our time as Psychosomatic Medicine.

Arnold Toynbee (1) defines prophecy as "the revelation of a mystery that is out of the intellect's reach . . . The utterance of Truth from a hidden source from which Truth cannot be extracted by intellectual processes." The third Gospel and the Acts are saturated indeed with many such prophetic religio-medical and social truths. Thus St. Luke rises as the first Christian medical prophet as well as the first medical missionary.

St. Luke's Gospel is also a perfect example of what modern anthropologists would call an acculturation. The philosophy of the third Gospel and of the Acts reveals a psychosynthesis of Hellenistic and Judaistic thought and inevitably some medical ideas. The literary beauty of the third Gospel lies in its Grecian simplicity. But its spiritual meaning lies in its stress on the practice as well as the preaching of Christian principles. St. Chrysostom (2), in his exegesis of the third Gospel, opens with this laconic tribute: "Luke the blessed, a physician, became also a physician of souls, thus ascending from an inferior to a superior occupation."

Luke enjoys a unique position among the other evangelists. It is fairly certain that he

[1] Presented before the Section on Medical History, College of Physicians of Philadelphia, 9 October, 1956.

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was born in Antioch (3) at the end of the last century B. C. He was a Greek by birth, a Hebrew proselyte by choice and a physician by training. It is only in Luke that one finds a union of Hellenism and Judaism, and the highest expression of this confluence of cultures is expressed in one simple word—*Faith.*

Faith was a strange and barbaric word to the Greeks, who accepted only rational thinking. Yet faith to the Oriental, as expressed in the Psalms, has a meaning of unconditional surrender to some divine power. But in St. Luke's writings faith appears to be a constructive force from within, a blend of thought and belief, an outgrowth of the interaction of the spiritual forces from within and the scientific forces from without. Thus St. Luke repeats to the suffering, time and time again, "Take heart . . . Be not afraid . . . Thy faith hath made thee whole . . . Walk in peace."

Luke's concept of faith was the outcome, in some respects, of the medical thinking prevalent in the late first century A.D., when both the third Gospel and the Acts were written. At that time Hippocratism had entered into its sunset hours and the medical horizons were blurred by the spirits and voices of the much older and still potent Oriental medical theories. Thus the ancient quest for the relief of suffering, which is the essence of human life, created a medical Babel at the beginning of the sunless ages of human history.

About this time there was a group of physicians in Asia Minor known as the Pneumatists (4). They believed that the four Pythagorean elements—fire, water, air and earth—were not sufficient to explain human existence. They taught the existence of a "pneuma" or a spirit which governed human beings and induced diseases in them if offended. Aretaeus (4) was the chief exponent of this theory and he was a close friend of St. Luke.

Besides faith, Luke's greatest expression of medical wisdom comes in the reference that he, alone of all the evangelists, makes to the ancient proverb (5), "Physician, heal thyself." Inspired by the old Hellenic dictum at the entrance of the oracle of Delphi, "Know Thyself," these two ideas, faith and the knowledge of oneself, are indeed Luke's everlasting testament to the medical profession.

These are some of the roots of St. Luke's contributions as a prophet of psychosomatic medicine. The Christian world celebrates his feast day on October 18. The Section on Medical History of the College of Physicians of Philadelphia honors his memory this month by presenting this panel on faith and healing: origins of psychosomatic medicine.

And there is no better introduction to this symposium than the one St. Luke makes to his Gospel, addressing one Theophilus, a man unknown except that his name means a lover of God, of truth, of wisdom, of Logos. In part it reads as follows (6):

"I too have thought necessary, having kept in touch with the whole course of these events, to write a history, which I dedicate to you, Theophilus, in the hope of bringing home to Your Excellency the truth of what you have already learnt."

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The Origins of Psychosomatic Medicine[1]

By Edward Weiss, M.D.[2]

ALTHOUGH the term psychosomatic was first used more than a century ago,* it did not come into common usage until Flanders Dunbar introduced it into American medicine about 1935. Following World War II its adoption was rapid. For the first time a term was available that made sense to the general physician in relating the emotions to bodily illness. Although many objections have since arisen to its use (chiefly that it perpetuates the dichotomy of body and mind which it was supposed to eliminate), it has served a useful purpose.

Psychosomatic describes an approach to medicine as old as the art of healing itself. It is not a specialty but rather a point of view which applies to all aspects of medicine and surgery. It does not mean to study the soma less; it only means to study the psyche more. It is reaffirmation of the ancient principle that the mind and the body are one, that they function as interactive and interdependent organs—a principle which has always guided the intelligent general practitioner. As a science, psychosomatic medicine aims at discovering the precise nature of the relationship of the emotions and bodily function. Research in the subject is founded on the confluence of modern physiological investigation, as developed by laboratory science and animal experimentation, and by the discoveries of psychoanalysis, both representing dynamic outgrowths of medicine. These modern streams of thought and investigation are now in the process of integration and the combination gives promise of establishing real progress in medicine. The whole subject was given a great impetus as a result of World War II. Indeed, it may be said that psychiatry was established on a firmer scientific basis in World War I and saw a substantial integration into general medicine in World War II. This, then, is psychosomatic medicine. When the integration is complete we may not have to use the term, for good medicine will then be psychosomatic.

Physicians have always known that the emotional life had something to do with illness, but the structural concepts introduced by Virchow led to the separation of illness from the psyche of man and a consideration of disease as only a disorder of organs and cells. With this separation of diseases into many different ailments came the development of specialists to attend to all of these distinct diseases. With the specialists came the introduction of instruments of precision and the mechanization of medicine began. This was a logical outcome of the development of general science (2). The laws of movement of the planets, the laws of motion, the law of gravity, the laws of gases, the laws of hydraulics—all of these, following the domination of physics and chemistry of 17th century science, were to be applied practically, and would result in the world of wheels, and steam power and clocks and vehicles—in a word, machinery. Seventeenth century science also developed calculus as an instrument for measuring the physical world so, arising from both, came the desire to explore the physical world and the desire to measure it. The new science had a profound influence on all disciplines. Medicine could not escape the philosophy that the material universe behaved like a machine which obeyed regularly defined and discoverable laws. Was it not logical to conclude that

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* Margetts (1) credits Heinroth, a German psychiatrist, with the first use of the term in 1818 in a discussion of insomnia.

life itself was nothing but a series of complex physical-chemical reactions and that all one had to do was discover the laws governing such reactions? Medicine, influenced by mechanism, began to apply the tools of physical science to the study of the human body in health and disease. The heart was a pump, the lungs a bellows, the arms and legs obeyed the laws of leverage. If the body was a machine, then sickness was malfunctioning of the machinery, and healing was akin to "fixing" the machine. Medicine now contented itself with the study of the organism as a physiological mechanism, impressed by blood chemistry, electrocardiography, and other methods of investigation, but unimpressed by and, indeed, often holding in contempt the psychological background of the patient, which was not considered so scientific as the results of laboratory studies. This period may, in truth, be referred to as the "machine age" in medicine. It is not to be denied that remarkable developments have occurred during this period of laboratory ascendancy, but it also must be admitted that the emotional side of illness has been almost entirely neglected.

Humanistic influences were introduced by Sir William Osler, who revolutionized the teaching of medicine with his "bed-side" approach. Part of this influence must be attributed to a parish priest, Father Johnson, founder and warden of the Trinity College School, who was first among those to whom Osler's text book on medicine was dedicated. As Dean Jeremiah Finch (3) said, "Johnson illustrated, as Osler put it, "that angelical conjunction (to use Cotton Mather's words) of medicine and divinity more common in the sixteenth and seventeenth centuries than in the nineteenth. An earnest student of Sir Thomas Browne, particularly of the *Religio Medici*, he often read extracts in illustration of the beauty of the English language, or he would entertain with some of the author's quaint conceits, such as the man without a navel (Adam), or that woman was the rib and crooked piece of man."

Frequently when he touched serious subjects, Osler's mind seems to have turned to Browne by a natural process of association:

> "I began by speaking of the art of detachment as that rare and precious quality demanded of one who wished to take a philosophic view of the profession as a whole. In another way and in another sense this art may be still more precious. There is possible to each one of us a higher type of intellectual detachment, a sort of separation from the vegetative life of the work-a-day world—always too much with us—which may enable a man to gain a true knowledge of himself and of his relations to his fellows. Once attained, self-deception is impossible, and he may see himself even as he is seen—not always as he would like to be seen—and his own deeds and the deeds of others stand out in their true light. In such an atmosphere pity for himself is so commingled with sympathy and love for others that there is no place left for criticism or for a harsh judgement of his brother. 'But these are Thoughts of things which Thoughts but tenderly touch,' as that most liberal of men and most distinguished of general practitioners, Sir Thomas Browne, so beautifully remarks; and it may be sufficient to remind this audience, made up of practical men, that the word of action is stronger than the word of speech."

On another occasion Osler asserted, "that no book has had so enduring an influence on my life . . . it turned my thoughts toward medicine as a profession, and my most treasured copy—the second book I ever bought—has been my constant companion for thirty-one years."

Here is the evidence and testimony of one of the great physicians of our time that two sources of deep religious feeling had influenced his life and his teachings—Sir Thomas Browne and his *Religio Medici*, and Father Johnson, the parish priest.

And now we have come to a new and revolutionary period in medicine—the psychosomatic era. The medical experiences of World War II are largely responsible. Physicians who served in the military forces returned to civilian practice with a healthy respect for the psyche as a factor in producing illness and a genuine desire to learn more about the subject. For the first time in half a century a familiar pattern of medical education has been infused with new ideas and subjected to bold experimentation. The social-psychiatric point of view has gained wide acceptance in medical

education and the doctor-patient relationship is undergoing scientific scrutiny. The fragmented, "organic-disease" approach has given way to the patient as a person and the art of medicine, so ideally exemplified in the person of William Osler, is being studied from a social and psychiatric viewpoint.

It is no longer too much to hope that every physician will be so trained that he may be able to understand and manage the many emotional problems that are presented to him daily. In order that this may come about we can no longer afford to miseducate in medicine. By this I mean the concentration on the study of organic disease to the exclusion of the emotional life. We must incorporate the humanistic approach and this can only come about if we include in our medical teaching the social and psychiatric viewpoints presented by experts in these fields. In the same way we must bring medical instruction into social work and psychiatry. Then at long last we will break down the false alignment that has so long existed between "scientific" medicine and the humanistic approach.

When that day comes we will no longer need the term psychosomatic, nor even comprehensive medicine, because good medicine will embrace both.

In his *History of Medicine*, Garrison stated that the fundamental error of medieval medical science, as originally pointed out by Guy de Chauliac and later elucidated by Allbutt, was in the divorce of medicine from surgery. He might have added that the fundamental error of modern medical science has been in the divorce of both from psychiatry.

The science of medicine began with the study of man on the dissecting table. It must continue with the study of man as a human being, possessed of loves and hates, urges and passions, capable of disturbing the body as well as the soul.

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The Need to Believe[1]

By Kenneth E. Appel, M.D.[2]

THERE are forces at work in patients that are not determined by what we can see, what we can touch, what we can weigh, what we can smell, or what we can hear. People often seem to get well because of relationships with other human beings. These relationships with other human beings involve, I think, devotions and dedications to constructive forces in life and in the world which are spoken of as hope, faith, and love. They have always been manifested by the medical profession at its best and are forces akin to religion. The doctor who engages in an active search for the healing of his patient is showing these constructive forces, and the patient somehow comes to identify with him. A devoted and dedicated physician is able to tap and mobilize these constructive forces of growth and life in the individual. The complexities of life and of human nature, and the uncertainties of prediction should make for humility. They are a challenge to our science, our philosophy, and our religion.

Psychiatry has been related to religion both historically and ideologically. Throughout the Middle Ages there were islands of constructive humanity—love and kindness—at Monte Cassino and other places. But for a long time in the Middle Ages, the primitive, demonological conception of illness held sway, particularly in connection with the mentally ill. Torture and persecution were meted out on the basis of certain aspects of the Judeo-Christian tradition. "Thou shalt not suffer a witch to live", seemed to be a religious injunction with regard to the treatment of psycho-pathological conditions. Ideologically St. Paul stated succinctly the problem of conflict with which much modern psychiatric thinking is concerned: "For the good that I would, I do not; but the evil which I would not, that I do." This tradition has certainly represented a challenge to psychiatry and medicine. In the Judeo-Christian scriptures there are many statements which deal with the problems of human suffering, illness, psychology and healing:

> "Because he has set his love on me, I will deliver him . . .
> He will call on me and I will answer him,
> I will be with him in trouble,
> I will deliver him . . .
> God is our refuge and strength,
> A very present help in trouble.
> Therefore will we not fear" . . .
>
> Psalms 91 and 46.

> "Love suffers long, is kind . . .
> Takes no offense . . .
> Is not joyful over wrong,
> But is joyful with the truth;
> Overlooks all . . .
> Hopes all, endures all."
>
> I Corinthians 13.

Anyone who has been caught in the depths of mental suffering knows the meaning of these words and accounts of human relationships and strivings, which modern psychological terms often do not improve upon. Without irreverence, may I quote from Psalm 139, something which sounds singularly like modern psychoanalysis: . . . "Thou has searched me and known me; Thou knowest my downsitting and my uprising, Thou understandest my thought afar off. Thou measurest my going about and my lying down, and art acquainted with all my ways." . . . I mention these things to indicate that there are bits of ancient wisdom which are helpful even to those of us who believe we are working on the wave of the future.

Diagrams presented as slides but not here reproduced indicate the setting in which

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modern psychiatry moves. Ancient medicine involved demonological conceptions of disease; sickness was possession by evil spirits, and cure was by magic, charms and incantations. These notions and mechanisms are not completely absent in the practice of medicine and psychiatry today. Other cultures of the ancient world have writings on these subjects. Hippocrates in the fifth century B.C., and later Galen, in their writings on hysteria, tried to base their thinking on observation and empiricism. The Middle Ages, unfortunately, except for the islands of mercy and kindness already mentioned, especially at Monte Cassino, showed a persistence of demonic conceptions. Cruelty to patients was punishment to evil spirits and to the destructive forces within. We read of chains, scourging, exorcism, and confinement. It may be mentioned that up until the last month some of the mentally ill in Philadelphia had to go to jail because the community did not supply adequate hospital facilities for them. Pinel in France, and Tuke the Quaker in England, introduced humaneship–the humanitarian treatment of the mentally ill. Thus there have been various traditions in medicine. Demonology, witchcraft, astrology and the Royal Touch were concepts important in the history of psychiatric thinking as well as the kindlier humanitarian traditions.

Paracelsus, at the time of Columbus, was interested in the influence of the planets and magnetism on health, illness and the cure of disease. Mesmer, who went from Vienna to Paris, was driven out of the latter city because it was believed that he was a charlatan and that his concept of the passage of magnetic fluid between persons was untenable. Braid, the Englishman, showed that there was not a magnetic influence between people, that magnetic substance did not pass from one individual to another. He believed the effects were psychological—something in the nature of feelings and personal influence which priests have always felt and which true physicians always recognize. Dubois in Switzerland thought that by reasoning with mentally ill people he could help them. He unquestionably effected many cures by this procedure. The Frenchman Dejerine believed that persuasion was important, that it was not just ideas that moved people but the feelings and the personal influence of the physician. The great Charcot studied hysteria. He believed this condition was physiological and hereditary. Liébeault and Bernheim studied hypnotism and concluded that it presented a marked degree of suggestion. Janet and Freud studied under Charcot and it became clear to them, following the work of Liébeault and Bernheim that the manifestations of Charcot's hysterics were often caused by suggestion and could be removed by hypnotism. All this led directly to the importance of subconscious and unconscious ideas, impulses and feelings, the conflict between what one was aware of and his unconscious pressures, the manifestation of these conflicts in psychopathology and their removal or attenuation by psychological means or operations. Thus we are led into modern psychopathology, psychotherapy and psychoanalysis. Witchcraft was essentially hysteria and the Royal Touch and mesmerism were suggestion and hypnotism. Faith and belief were clearly important. Freud, from his minute, painstaking observations and by his detailed descriptions, was able to bring before psychiatrists and the medical fraternity, the great significance of psychological influences from the past on the present life of the individual, and the tremendous importance of the analyst and the patient's transference in the process of change and the resolution of conflicts.

Faith healing is perhaps the oldest form of therapy in the world. It grew up side by side with medical practice in its oldest and crudest forms, when disease was thought of as being caused by evil spirits. The Dionysian mysteries in part involved cures through wild music and dancing. Appeal was made to the deities who supposedly had sent the disease. Madness and epilepsy were not the only conditions that were cured. From the inscriptions at Epidaurus in Argolis during the fourth century B.C., we

learn that such diseases as spots on the face, blindness, lameness, barrenness, paralysis and gout were cured by the power of the god joined to the faith of the sufferer (1). The faith of the sufferer, under the influence of the therapist, has always been and is at the present time, one of the most important influences in many illnesses,—not all, of course. Christian churches have always offered prayers for the sick. One thinks of sacred relics and shrines, the Shrines at Lourdes and Ste Anne de Beaupré and the Pool of Bethesda. Many utterances of Jesus and the Apostles, have been of importance in this healing tradition. About a century ago, Dr. Cullis of Boston created a sensation by preaching the efficacy of prayer in the cure of bodily ills, while John Dowie of Zion City maintained a hotel-like establishment which he called the 'Divine Healing Home'. With the method of praying and laying on of hands the latter apparently effected cure of many illnesses. Christian Science also developed in this country during this period. Dr. Phineas Parkhurst Quimby, of Portland, Maine, was perhaps its forerunner. Mary Baker Eddy was a patient of Dr. Quimby, and may have derived many of her ideas from him, though this is not the belief of her followers. Dr. Quimby made certain observations through experiments with hypnotism. A boy whom he was in the habit of hypnotising, pretended to diagnose disease while in the hypnotic state, and prescribed remedies. Dr. Quimby found that the boy always named the diseases the patients believed they had. The remedy, even though a perfectly inert substance, apparently effected cures. A recent issue of the *Reader's Digest* has an article concerning this problem of placebos—of administering inert substances for therapeutic purposes (2). Every physician knows that the influence of the doctor and the hopes of the patient somehow or other often combine to promote health. The administration of inert substances may enhance this process. From this kind of experience Dr. Quimby concluded that it was the faith of the patient that was responsible for the cure, and he gave up hypnosis. He tried to explain these things to patients, and when they understood, cures often followed.

Rev. Elwood Worcester, former rector of St. Stephen's Church in Philadelphia who later founded the Emmanuel Movement in Boston, developed the moral treatment of nervous conditions. In this effort Worcester worked with medical practitioners as his cases required (3). At the present time Rev. Dr. Alfred W. Price conducts spiritual healing services at St. Stephen's Church, which perhaps some of you are familiar with, continuing this tradition in his church and in others. Certainly the results throughout the world indicate that some conditions which are thought of as primarily medical, certainly conditions that are considered to be psychological, apparently receive help and healing from religious practitioners. Just last year there was a report in the *British Medical Journal* on Divine Healing, prepared by a commission set up by the Archbishops of Canterbury and York. Questionnaires were sent to many doctors. Many of the case histories, however, were thought to be inadequate and needed supplementation and more careful diagnosis. Many criticisms were naturally advanced by the medical profession. Yet it was concluded that evidently in many conditions spiritual healing was helpful, and the report mentioned the category of psychogenic and psychosomatic illnesses, rather than organic conditions, as being especially favorable areas for religious help. The report indicated that disorders of psychological origin were cured by many methods affecting the patients' minds and emotional states. These included spiritual healing, laying on of hands, unction, and forms of analytic treatment, suggestion and hypnotism. The relief of psychogenic disorders appeared to depend partly on the individualities of the patient, and in part on the personality of the healer. It was said that reputed cures of organic disease allegedly coming from spiritual healing probably belonged in the category of mistaken diagnoses. I believe this is questionable, because certainly the experience of people with gastric ulcers, and the

work of Wolff and Wolf at Cornell in New York, has shown that psychological influences can determine the amount of circulation in a part of the body, can modify the movements of the stomach and alter the secretion of gastric juices. There is experimental evidence that the influence of a physician can change the temperature of various parts of the body, particularly the hands, by many degrees of centigrade. If that sort of thing can take place purely by the influence of one individual human being on another, then I would think that it is possible that healing can take place through psychological means, even in certain organic conditions (4).

An interesting article in the *Atlantic Monthly* discussed the effects of electroshock on depression and the lowering of blood sugar by insulin in schizophrenia, and leucotomy (5). The author, a psychiatrist, pointed out the relationship between these shock phenomena produced by modern methods in psychiatry and shock experiences developed by Rev. John Wesley, the founder of Methodism, for the relief of spiritual depression. The author quotes Grinker and Spiegel, who wrote on the war neuroses, and then he quotes from Wesley. May I give you just one or two of these quotations. Grinker and Spiegel write from the last war, in the treatment of war neuroses: . . . . "terror exhibited, electrifying to watch, body tense, rigid, eyes wide, pupils dilated, skin covered with perspiration, incredibly rapid or shallow breathing, intensity of emotion unbearable, frequently at height of reaction a collapse, patient falls back in bed, remains quiet a few minutes." Wesley, two hundred years ago reported: "Many offended at cries of those on whom power of God came; a physician saw and heard a woman he knew, scarcely believed it, strong cries, tears, great drops of sweat run down her face, bones shook . . . knew not what to think, neither fraud nor natural disorder . . . but when both her soul and body were healed in a moment, he acknowledged the finger of God." Grinker and Spiegel report: "Stuporous become alert, mute can talk, deaf hear, paralyzed move, terror-stricken psychotics become well-organized individuals." And Wesley reports: "I will show you him that was a lion, now meek as lamb, who was drunkard, now extremely sober, whoremonger that was, now abhors very garment spotted by flesh." This article includes a remarkably interesting discussion in which the author correlates certain strong religious experiences (which apparently wipe the slate clean) with physiological shock treatments, Pavlov's theories of cortical inhibition following temporary cortical stimulation or excitement in animals, and the psychoanalytic experiences of abreaction, transference and increased suggestibility.

For centuries religion and medicine have been closely related. Psychiatry as a branch of medicine in its psychotherapeutic methods at times approximated closely the procedures of religion. There are still rigid procedures in psychiatric therapy today which are practically rituals. Although science and religion assumed distinctive roles in society as time went on, they continued to share projects and designs for human betterment. In order to clarify this belief, a group of psychiatrists made a declaration a number of years ago. In 1947 the Group for the Advancement of Psychiatry made a statement that they believed in the dignity and integrity of the individual and that the major goal of treatment was the progressive attainment of social responsibility. They also recognized the crucial significance and influence of the home on the individual, and the importance of ethical training in the home. They also emphasized the important role religion can play in bringing about an improved emotional, moral and physical state. Methods of psychiatry, they stated, aim at helping patients achieve healthy emotional lives so that they may live in harmony with society and its standards. These psychiatrists wrote that there was no real conflict between psychiatry and religion. It was felt that in practice competent psychiatrists would be guided by these principles.

Dr. Menninger in his book *Psychiatry in a Troubled World* (6) reports a survey of soldiers

in the last war which showed that 53% of officers and 63% of enlisted men, in the series studied, felt that prayer helped a lot. Similarly, 15% and 13% respectively felt that prayer helped some, and 6% in both groups felt that prayer helped little or none. Twenty-six percent of officers and 18% of enlisted men did not think of it. In the United States we have a country of 170 million people with a church membership of 100 million people. Apparently, psychiatry confirms the fact that beliefs and devotions determine not only physiological functions of the body, as Dr. Wolff and others have shown, but the social functions of the individual as indicated by the behavior of people.

In summary, we may say that modern psychiatry believes that emotions produce alterations—psychological, physiological and social, in individuals. It seems evident that a religious faith and devotion that bring peace, integration and satisfaction will be health-promoting. Various types of psychotherapy apparently produce the same percentage of cures. Reverend Dr. Price in Philadelphia today reports a percentage of cures very similar to that of the psychiatrists. There is comparable effectiveness. Therefore, there must be something basic beneath these intellectual formulations and theoretical frames of reference. I believe that that factor is probably the emotional relationship between the therapist and the patient, the caring, loving devotion and interest on the part of the therapist, and the faith the patient has in him. There is an identification of the patient with the therapist which can be equated with trust and faith. The therapist has to have a compassion, benevolence, and objectivity which enables him to see and catch the positive, creative growth or love impulses in the patient. A reciprocal relationship is developed in which creativity and love is cultivated. This helps extricate the patient from the destructive influences of hate and aggression and the withdrawing influences of fear and guilt. As you see, I have not put great emphasis on the intellectual functions. The reason I have not is because of the reports that similar percentages of recovery occur with different types of therapy, with different theoretical approaches, and with different intellectual frames of reference. There must be something more basic. I have been confirmed in this belief by something I read long ago. It was about St. Augustine's going to Milan as a teacher of rhetoric. He was dissatisfied with rationalism and reason in the conduct of life. In Milan he met Ambrose, Bishop of Milan, and Augustine recounts in his *Confessions*, "That man of God received me as a father, and showed me Episcopal kindness on my coming. Henceforth I began to love him, at first, indeed, not as a teacher of the truth". That is to say the primary, constructive, real integrating force of this great teacher, a foundation stone of Western thinking, of Western religion, was his human relationship with the kindly Ambrose, Bishop of Milan. I think this type of historic evidence is important in our reflections when we think of the relationship of religion to psychiatry.

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Memoir of William B. Swartley (1884–1955)*

By S. Dana Weeder, M.D.

WILLIAM BLAINE SWARTLEY was born August 30, 1884, in Lansdale, Montgomery County, Pa. He was graduated from the Lansdale High School in 1902 and entered Albright College, Reading, Pa., where he remained two years. He entered the University of Pennsylvania in 1905 as an undergraduate and graduated from its Medical School on June 16, 1909. He served an internship at the Germantown Dispensary and Hospital from July 1909 to October 1910. From there he went to the Pennsylvania Hospital where he served as Intern and became Assistant Chief Resident. He was at the Pennsylvania Hospital from October 1, 1910 until March 1, 1912. In April 1912 he returned to the Germantown Hospital to complete the unfinished internship of Dr. Percy Shaw. In 1912 he was made Assistant Surgeon on the Services of Drs. George G. Ross and Francis T. Stewart at the Germantown Hospital, and also the Chief of Surgical Dispensary.

Elevation to the rank of Clinical Assistant Surgeon, Surgical Dispensary of the Jefferson Hospital, Jefferson Medical College, on the Service of Dr. Francis T. Stewart came in 1913, where he remained until 1920. Dr. Stewart reposed great confidence in Dr. Swartley and made him Clinical Assistant Surgeon at the Jefferson Hospital and the Jefferson Medical College in 1913. He served with Dr. Stewart until Dr. Stewart's death in 1920. His interest in Jefferson was very great and in addition to having served with Dr. Stewart, he served in the Anatomical Laboratory as a demonstrator of anatomy, beginning in 1920 and continuing until 1948. Aside from surgery, probably the greatest interest that Dr. Swartley had in the field of medicine was anatomy. It was his habit to constantly quiz interns and surgical residents about the anatomy presented either in the operating room or on the wards in making a diagnosis and its relationship to the diagnosis. He has been well known by most ex-Jefferson students because of his clear teaching of anatomy in their first year of medical college.

In 1913 and 1914 Dr. Swartley served as Assistant Dispensary Surgeon to the Children's Hospital on the service of Walter E. Lee. Later, in 1917, Dr. Hiram R. Loux appointed Dr. Swartley as Assistant Surgeon to the Philadelphia General Hospital. He continued in this capacity until 1926. Further advancement came to him at the Germantown Hospital in 1922 when he was made Attending Surgeon to fill the vacancy caused by the death of Dr. George G. Ross. In 1934, in addition to his duties as Chief of Surgery at Germantown, he was made Chief of the Department of Anesthesia. In 1939 he was elected to the Office of Director of Service, Department of Surgery, Germantown Dispensary and Hospital.

The Philadelphia Hospital for Contagious Diseases, in 1940, made him Chief Surgeon. In 1930 he was named Surgeon to the Chestnut Hill Hospital. Because of illness, in 1948, Dr. Swartley was made Consulting Surgeon to the Chestnut Hill Hospital and to the Germantown Hospital.

Dr. Swartley's military service began in 1915, when he was attached to the American Ambulance Hospital of Paris, where he served from October 1, 1915 to January 12, 1916, under the auspices of the Pennsylvania Hospital Unit commanded by Dr. James P. Hutchinson. He was made a First Lieutenant in the United States Army Medical Corps in 1918. He served at the Rockefeller Institute for Medical Research in New York City and later transferred to the Walter Reed Army Hospital for a course of study on the treatment

* Prepared and published at the request of the Council of the College of Physicians of Philadelphia.

of empyema and the use of Dakin's solution in the treatment of infected wounds. In 1924 he was appointed Captain of the Medical Officers Reserve Corps, and was granted the "Selective Service Medal" in 1946.

Dr. Swartley was a member of the Presbyterian Church, Phi Alpha Beta Fraternity at the University of Pennsylvania, The H. C. Wood Medical Society, The Philadelphia County Medical Society; Fellow of the College of Physicians of Philadelphia, Philadelphia Academy of Surgery, Fellow of the American College of Surgeons, Certified by the American Board of Surgery in 1938—Founders Group. He was made President of the Alumni of the Interns of the Germantown Dispensary and Hospital in 1946, President of the Medical Staff of the Germantown Dispensary in 1947, President of the Inter-Hospital Bridge Whist Association 1946–47, President of the Doctor's Golf Association 1948, and Treasurer of the Philadelphia Academy of Surgery from 1922 to 1936. From 1922 to 1945 he was Treasurer of the *Bulletin of Surgical Clinics of Philadelphia.*

Dr. Swartley was very interested in sports. At Lansdale High School he played second base on the baseball team and tackle on the football team. At Albright College he played baseball, tackle on the football team and guard on the basket ball team. While at Albright he also sang in the Glee Club and later sang in the University of Pennsylvania Glee Club. One of his great interests was the basketball team of the Germantown Hospital Nurses and he coached them as Assistant Coach for many years. Later he became interested in golf and played it a great deal as a member of the Huntingdon Valley Golf Club. He was one of the regular attendants of the meetings of the Philadelphia Doctor's Golf Association. He was also interested in tennis and for a while, squash.

It is obvious that Dr. Swartley had many and varied interests. Surgery and the advancement of it came first; certainly teaching played a very important part in his life. He was also interested in other fields, particularly in sports, the Philadelphia Doctor's Golf, and the Philadelphia Doctor's Bridge League and other activities that were associated with physicians.

On September 10, 1955, he was struck down with apoplexy which invalided him completely and finally resulted in his death on November 15, 1955.

Memoir of Hubley R. Owen (1883–1955)*

By Lewis C. Manges, Jr., M.D.

DR. HUBLEY R. OWEN was born in Pensacola, Florida, on May 8, 1883, the son of Captain Alfred Owen, a naval surgeon, and Mary Hubley Owen. His parents died of a contagious disease before he was a year old. Their son studied at the Friends School in Washington, D. C. and Episcopal High School in Alexandria, Virginia, and was graduated from the University of Pennsylvania School of Medicine in 1905.

Dr. Owen was appointed Chief Police and Fire Surgeon for Philadelphia in 1907 and served in this capacity until December 1939. He helped to organize the International Association of Police and Fire Surgeons in 1921 and served three times as President of this organization. During his early work with the firemen he became associated with Dr. J. Chalmers DaCosta and his co-workers at Jefferson Medical College Hospital and assisted in writing several editions of DaCosta's book, "Modern Surgery". Dr. Owen was subsequently graduated from Jefferson Medical College in the Class of 1915, thus having the unusual distinction of being a graduate of both the University of Pennsylvania and Jefferson Medical Schools.

Dr. Owen served in the armed forces during World War I and was attached to Base Hospital 38 in Nantes, France. After discharge he joined the Army Officers Reserve Corps in which he held the rank of Lieutenant Colonel.

The health and welfare of the Philadelphia policemen and firemen along with their families became his primary interest. He established the Welfare Organization among these men in 1925, enabling this group to obtain specialized medical care at a time when it was available to only the rich or poor. During this time he became greatly interested in the treatment of trauma, became a member of the American College of Surgeons' Committee on Trauma and was one of the organizers of the American Association for the Surgery of Trauma. He directed the production of several motion picture films depicting the proper emergency treatment of fractures. These films were the basis for many first aid courses throughout the country prior to World War II.

In January of 1940 he was appointed Director of Public Health for Philadelphia and served until January 1944. In 1941 he was named Chairman of the Philadelphia Council of Defense and served with distinction in preparing this city for civilian defense. In this connection he flew to England during the "blitz" to observe their defense and health programs.

In 1944 he was appointed Director of Medical Services of the Board of Education in Philadelphia and served in this capacity until 1949 when he was retired on age. Shortly after this retirement he was made Executive Director of the Heart Association of Southeastern Pennsylvania. He was hereby responsible for the expansion of the heart program into Bucks, Delaware and Montgomery Counties and the reorganization of the Philadelphia Heart Association as the Heart Association of Southeastern Pennsylvania. He organized an independent campaign for funds which greatly increased the Association's potentialities, making it possible for educational and community service programs to be developed.

Dr. Owen was a member of the Staffs of the Woman's Medical College, Philadelphia General, Jefferson, and Phoenixville Hospitals. He was Professor of Clinical Surgery at the Woman's Medical College and Instructor in Surgery at the Jefferson Medical College. He held memberships in the College of Physicians of Philadelphia, Philadelphia County Medical

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Society, American College of Surgeons and the American Board of Surgery. He was a past president of the Philadelphia Academy of Surgery and served for years as secretary to this organization.

Dr. Owen was an enthusiastic sportsman, being primarily interested in fox hunting. He was a member of the Pickering Hunt Club and was on its Board of Governors. A sincere Christian and churchman, he served as a vestryman at the Valley Forge Chapel.

Dr. Owen died on October 8, 1955. He is survived by his wife, the former Miss Maude Smith, a son, Col. Edgar R. Owen, and two sisters, Mrs. Gordon Crawford and Miss Christine Q. Owen, both of Washington, D. C.

Dr. Owen's surgical career was dominated by an intense desire to seek out and pursue new thoughts and methods, particularly in the field of trauma, and to aid young physicians in finding clinical material and financial stability. He was known for his personal charm, vital and outstanding personality, professional honesty and high ethical principles. He was accordingly endeared to his many friends, associates, patients and employees through his thoughtfulness and kindness.

Memoir of David N. Husik (1883–1955)*

By Benjamin H. Shuster, M.D.

WITH the passing of Dr. David N. Husik on November 20, 1955, the College of Physicians of Philadelphia lost a staunch friend and interested member.

Dr. Husik was born on August 15, 1883. He attended the Philadelphia public schools and Central High School from which he graduated in 1903. He graduated from the University of Pennsylvania School of Medicine in 1907 and then interned at the Philadelphia General Hospital from 1907 until 1908.

Dr. Husik became Chief of the Ear, Nose and Throat Department and served as Assistant Professor of Laryngology at the Hospital of the University of Pennsylvania until 1928. He was an instructor in otolaryngology at the University of Pennsylvania from 1910 until 1925. He instructed at the Philadelphia Polyclinic from 1909 until 1917. He also instructed at the Graduate School of Medicine of the University of Pennsylvania for many years. He was Surgeon in charge of the Nose and Throat Dispensary of the Hospital of the University of Pennsylvania from 1914 until 1928.

He served as Chief of the Nose, Throat and Ear Department at the Philadelphia General Hospital for thirty-five years. He was subsequently appointed Acting Consultant in 1947. He was an Associate Professor of Laryngology at the Graduate School of Medicine until his retirement in 1950. He was Chief of the Ear, Nose and Throat Department at Mt. Sinai Hospital (Albert Einstein Medical Center—Southern Division) for twenty years, becoming an active Consultant in 1948. He was also a Consultant to the Fire and Police Department of Philadelphia for many years.

Dr. Husik was a Fellow of the College of Physicians of Philadelphia and a Life Member of the Philadelphia County Medical Society. He was a Fellow of the Philadelphia Laryngological Society, a Fellow of the American Medical Association, a Senior Fellow of the Academy of Ophthalmology and Otolaryngology and a Senior Fellow of the American Laryngological, Rhinological and Otological Society. He published many interesting papers on diseases affecting the ear, nose and throat.

Dr. Husik made many friends during his life time. He was always willing and ready to be of service to anyone who needed him. An excellent teacher, he spent many hours in the clinics teaching medical students as well as graduate students. He attended medical meetings faithfully and took part in all activities of the societies with which he was associated. He will be missed by all of his friends, patients and colleagues.

He died in the Hospital of the University of Pennsylvania on November 20, 1955. He is survived by his wife Marguerite, and a daughter, Antoinette.

* Prepared and published at the request of the Council of the College of Physicians of Philadelphia.

Memoir of Thomas A. Shallow (1886–1955)*

By Frederick B. Wagner, Jr., M.D.

THOMAS A. SHALLOW was born on November 26, 1886, in Philadelphia, the city which remained his home and center of activities for his 69 years of life. Of Irish and Scotch-English descent, he was sixth in the family of seven children of Edward F. Shallow, a millwright, and Elizabeth MacQuillan Shallow, both of Pennsylvania. His preliminary education was obtained in the Philadelphia public schools, in which he distinguished himself as a student and won recognition as an athlete. At the age of fifteen his interest in medicine was already such that he would cut classes at Central High School to attend surreptitiously some of the postmortem examinations and teaching clinics at the old Medico-Chi Hospital. In 1907 he matriculated at the Jefferson Medical College. During his sophomore year he was president of the Spitzka Anatomic League, and was class historian in his senior year. He also was a prominent member of the last track team and last football team of the institution. At graduation in 1911, he received the Alumni Prize for highest general average of the four years as well as several other awards.

Dr. Shallow remained at Jefferson for his internship during 1911 to 1913, and from 1913 to 1914 he served as Chief Resident Physician. In addition to the latter position, he also worked with Dr. Hobart A. Hare in the department of experimental pharmacology and with Dr. Albert Brubaker as a quiz master in physiology. At this time his outstanding ability was recognized by the senior staff members, several of whom offered him their association. The hero for him of that day, however, was Dr. John Chalmers DaCosta, whom he prized to serve as personal assistant from 1914 to 1925. As a member of the faculty of the Jefferson Medical College, his career began as Clinical Assistant with promotion through the ranks to Professor of Surgery in 1931. The peak of his career was reached in 1939 when he was made Samuel D. Gross Professor and Head of the Department.

During his earlier years, Dr. Shallow served on the staffs of other local hospitals, among which were Philadelphia General, Saint Joseph's, Montgomery County, Delaware County, Sacred Heart, and Grand View in Sellersville, Pa. Later he restricted his operative work to Jefferson Hospital, but remained influential in the affairs of the other institutions. He was a member and former president of the Philadelphia Academy of Surgery, Fellow of the American College of Surgeons, International College of Surgeons, and founder member of the American Board of Surgery. He was also a Fellow of the College of Physicians of Philadelphia; member of County, State and American Medical Associations; American Association of the History of Medicine; and American Medical Editors' and Authors' Association. Dr. Shallow was active in the Nu Sigma Nu medical fraternity and a member as well as faculty adviser for the Alpha Omega Alpha honorary fraternity. He served as President of the Alumni Association of Jefferson Medical College in 1938. His portrait was presented to the Jefferson Medical College by the Graduating Class of 1950. An LL.D. degree from Jefferson Medical College was awarded him in 1953.

During World War I, Dr. Shallow served as Captain in the Medical Corps, 1917 to 1919. He was initially assigned to the Rockefeller Institute, New York, and later served as Surgeon to Evacuation Hospital Center #25 in France. During World War II he remained a civilian and was active in the accelerated educational program of that period.

Dr. Shallow's extramural activities were

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many and varied. He belonged to the Union League of Philadelphia, Philadelphia Racquet Club, Art Club of Philadelphia, Franklin Institute, and Pennsylvania Scotch-Irish Society. He found time to distinguish himself in civic affairs and was a member of the Board of City Trusts of Philadelphia, Board of Directors of Wills Eye Hospital, Board of Directors of the Philadelphia House of Detention, Advisory Board of Directors of the Municipal Court, Director on the Board of the Old Eagle School, a historical society, and Chairman of the Philadelphia Inquirer Hero Award Committee.

Hobbies played a very minor role in Dr. Shallow's life. He gave up golf during his later years and derived his main relaxation from fishing.

As a man, Dr. Shallow was constitutionally rugged, dynamic, and indefatigable. On the executive faculty of the college, his celerity of thought coupled with his profound knowledge of college and hospital affairs often aided in the rapid solution of intricate and vexing administrative problems. His advice was sought and followed by many. As a teacher he placed a great emphasis upon the clinical history and its correlation with the evolution of the pathologic process. His weekly clinic was an academic highlight, prepared with care and enhanced by the participation of his entire staff. His principles of surgery as well as technique were so consistent that the younger men who trained under him knew exactly what he would do in each situation. As an operator, his dexterity and judgment commanded the respect of all who knew him. Dr. Shallow frequently stated that he had no favorite operation, but it was generally conceded that he excelled most in surgery of the gastrointestinal tract. As a writer he made many contributions to the surgical literature. He pioneered in the operation of one stage pharyngeal diverticulectomy which combined the teamwork of surgeon and esophagoscopist. His private practice was huge, and he devoted much time and energy to individual patients, many of whom were referred for professorial opinion and care.

During his last illness due to carcinoma of the pharynx, he chose to work despite great discomfort and failing strength. In these final days he refused to discuss his illness or be coddled in any way, and stoically maintained his ready wit and humor until his death on December 26, 1955. He is survived by his wife, the former Myrtle C. Luman, whom he married in 1920. Few are aware of the many personal sacrifices she made for him and her loyal devotion over the years. It is with her that we mourn the loss of a counselor and friend, an extraordinary colleague, and truly a man's man.

TRANSACTIONS & STUDIES
of the
College of Physicians of Philadelphia

Volume 24
(Fourth Series)

Number 4
(April 1957)

President's Address

By LEWIS C. SCHEFFEY

THE year 1956 will long be remembered in our annals for it witnessed the completion of the building and rehabilitation program of the College. On May 16th this accomplishment was signalized by a friendly reception and "open house" attended by many of the Fellows, some with their wives, together with quite a number of those contributing friends and donors who had accepted invitations to share in a truly joyous affair.

In rendering a report of its final meeting and requesting its own discontinuence at the October Meeting of Council, the Building Committee presented as a matter of record, "its particular appreciation of the personal interest and painstaking labors of the architect—Mr. Robert C. McGoodwin, and of the builder—Mr. Allan D. Cornell; also, its gratitude to the Counsel of the College—Mr. Eric McCouch—for his generous help in resolving some of the legal problems which arose in the course of the Committee's work." Council was requested to accept all unexpended monies, collected or existent in the Building Fund by accrual. Thereupon the Committee was discharged with thanks.

The series of "Newsletters" begun in 1955 have continued to keep the Fellows currently informed of College affairs and of the activities of its Fellows. Likewise they accumulate as an integral part of our Archives. Hence I shall not consume time and space by being repetitious or by duplicating material to be contained in the factual annual reports prepared by the responsible administrators concerned, and awaiting publication in a forthcoming issue of the *Transactions & Studies* of the College.

STATUS OF THE FELLOWSHIP

As of December 31, 1955, the entire Fellowship of the College numbered 1110, distributed in the following categories: 976 Resident, 122 Non-Resident, 3 Associate, 4 American Honorary, 3 Foreign Honorary, 2 Honorary Associates. This represents a net gain of 20, as compared with a net gain of 43 one year ago.

DEATHS

Twenty-one Resident and two Non-Resident Fellows died during 1956—23 in all. Let us stand for a moment of silence in reverence and respect to the memory of the following departed colleagues:

Resident

Thomas G. Aiken
Edward J. G. Beardsley
Charles W. Bonney
Robert K. H. Charr
John M. Cruice
*Howard Dehoney
Lowell A. Erf
Reuben Friedman

* Howard Dehoney who died July 4, 1955, was reported on Necrological List in "Transactions", but not mentioned in the President's Address in 1955.

John H. Gibbon, Sr.
Roy L. Langdon
Edward McCloskey
James R. Martin
Francesco Mogavero
Rufus S. Reeves
James L. Richards
William Egbert Robertson
Henry S. Ruth
Mary Bickings-Thornton
Stephen E. Tracy
Nathaniel W. Winkelman
Resident 21

Non-Resident

W. A. Newman Dorland
Daniel N. Shewbrooks
Non Resident 2

23 Total

ADMINISTRATIVE STAFF OF THE COLLEGE

I now wish to speak rather intimately, and with sincere appreciation, of the Administrative Staff and personnel of the College to whom we owe so much for the smooth functioning of our facilities and services. With the newly-built book stacks ready for occupancy, the Library Staff had plenty to do during the late spring and summer months. There was a great deal of satisfaction associated with the work of utilizing the new stacks for this provided a splendid opportunity to re-evaluate material at hand and arrange the same with an eye to the future. The gratitude of all of us goes to our dedicated Librarian, Mr. Elliot H. Morse and his efficient assistants Miss Walsh and Miss Hodge, as well as to other co-workers—Misses Colabrese, Ceci, Zeldis, Minton and Mrs. Miragliotta. Appreciation of the efforts of the pages,—Misses Gilliam, Kahler, Wallace and Siaga, is likewise acknowledged with much satisfaction.

Adequate and safe replacement of the Library's outstanding historical collection and arrangement of the Packard-Krumbhaar Alcove received the devoted attention of Doctor McDaniel, whose labors were rewarded by finding even new treasures among the old.—We owe much to the Curator of the Library's Historical Collections, whose brilliant accomplishments are veiled by his innate modesty.

As noted in the June "Newsletter," Dr. Fred B. Rogers was appointed Editor of the "Transactions & Studies" when Mr. Beatty resigned. In the interval since then, this accomplished physician and medical historian has mastered the position in fine style; the College is indeed fortunate in his acquisition. Likewise, Mrs. Jean Stevens, who became Executive Secretary of the Medical Literature Service after Mrs. Beatty's departure, has proven her adequacy in this respect.

Mrs. Ella N. Wade, Curator of the Mütter Museum and Custodian of the College Collections, rendered conspicuous personal service in completing the rearrangement of specimens and relics stored during the renovation of the Museum. In fact, this brilliantly illuminated area has become a "crown jewel" of the College, now able for the first time to adequately display its unusual and original collection. We compliment Mrs. Wade not only for her loyal service, but also for the interest in the Museum which her stories in "Philadelphia Medicine" and elsewhere have created.

The "Office of the College" is Miss Lang. There is no such thing as privacy in this freely accessible area. Nevertheless, the Clerk of the College maintains unusual equanimity in carrying out a thousand and one tasks graciously and meticulously, seemingly undisturbed whether the casual entrant be a distinguished foreign visitor or the messenger boy with a bundle. Everyone of us owes Miss Lang an enormous debt of gratitude for her constant and long-time service in discharging the many clerical, financial, and other commitments that the organization of the College necessitates. Miss Drauglis is the efficient stenographer and typist whose services are also sincerely appreciated.

One cannot speak too highly of the competent and efficient manner in which the Superintendent, Mr. Allen, conducts his stewardship. His tours of duty and those of his staff are well-organized and available in precise memoranda relating to adequate inspection and maintenance of the building and its services. He has

on file, and for the first time to my knowledge, complete sets of blueprints relating to all phases of our present structure and its equipment. Mr. Allen's executive ability is paralleled by his ingenuity, "know how," and a broad perspective with regard to the future of the College and its needs. We thank him for his fine service and those associated with him: Messrs. Swain, Baker, Thorpe-Bey, Sutton and Bey.

OFFICERS, COMMITTEES AND SECTIONS

I can say with candor that again I have had the same fine degree of cooperation from the elective officers of the College that I enjoyed during my first term of office; likewise with the appointive committees, the prize committees, and the officers of the sections. Without this cohesion and liaison, we could not have gone forward and met the increased tasks and responsibilities which have gone hand in hand with our material expansion.

At this time I express the appreciation of all of us to our Fellow, Leandro M. Tocantins, who served well and faithfully as Secretary of the College since 1949. At the same time Council accepted with sincere regret the resignation as Censor, of our eminent Past President, O. H. Perry Pepper. Sorrowfully we report the deaths of John H. Gibbon Sr., Past President and Censor, and William Egbert Robertson, Honorary Librarian, during 1956, as previously noted in our moment of silence.

I would like to mention specifically the praiseworthy manner in which all the Committees of the College have discharged the business assigned to them—with judicial consideration, patience and positive action. Although some had more tasks to perform than others, I would be unjust to signal one out above another, and the thanks of the Fellows are due to all.

That the Prize Committees chose wisely in naming the recipients for the 1956–57 lectureships was evidenced by unanimous acceptance of their choice by the Committee on Scientific Business, and the gratitude of the College extends to them.

The programs presented by the Sections of the College, either alone or in combination, have been soundly prepared and attended by interested audiences. Details of these meetings will appear later in the "Transactions", as will also those of certain public meetings held.

As noted in certain of the "Newsletters", the College became the recipient in April of a Commemorative Congressional Medal given in recognition of the 250th Anniversary Celebration of the birth of Benjamin Franklin, for which our colonial background qualified us.

During the year an excellent bronze bas-relief of the illustrious S. Weir Mitchell, sculptured by the late Otto Schweizer of Philadelphia, was secured for placement in the Packard-Krumbhaar Alcove. We again emphasize the information made known to you in one of the "Newsletters"—viz.: that the College is the medical representative chosen as a member of the "Council for International Visitors" of the City of Philadelphia.

Since mentioning in last year's presidential address that the survey and recommendations relative to the reorganization and progress of the Philadelphia County Medical Society offered avenues suggesting mutual advantages, I am pleased to inform you that that Society invited us to participate with them in a Joint Committee to discuss just such possibilities. This courteous gesture was accepted by Council, and a Committee of the College has been appointed to join with that of the County Society for early consideration of the purposes concerned.

FINANCES

Throughout the past year I have undoubtedly annoyed and tried you with repeated exhortations to consider seriously the financial needs of the College, particularly in view of the increased maintenance costs and needed salary increases that necessarily follow expanded facilities. I need dwell no further upon the "whys" and "wherefores" of my frequent appeals.

The budget for the fiscal year 1956–57, as recommended by Council on the advice and thoughtful consideration by the Finance Committee and with the concurrence of the officers, is again a deficit budget. As such it is submitted to you for your approval or rejection at this

Annual Meeting, and is as follows:

Secretary		5,978.80
Treasurer		5,677.80
Publication Committee		3,855.00
Committee on College Collections		3,260.00
Hall Committee		28,714.00
Library Committee		79,220.00
Pension Reserve Fund		2,423.17
		129,128.77
Anticipated Operating Income 1956–1957		
Income Current Operating Account		72,145.22
Balance on hand 11/10/56		(5,843.53)
		66,301.69
Income Publication Committee		1,136.44
Income Committee on College Collections from the Abbe Fund		120.00
Operating Income—Library	40,727.85	
Balance on hand 11/10/56	4,607.61	45,335.46
Total anticipated operating income		112,893.59
Total anticipated operating expenses		129,128.77
Anticipated deficit 1956–57		($16,235.18)

In preparation for discussion of the financial situation of the College at the Annual Meeting, I considered it my duty to outline the situation briefly in the recent December "Newsletter". At the request of your President, the Finance Committee has and is continuing to make a comprehensive study of existent funds of the College, their distribution, and availability as sources of income. This study has included a diligent survey of the minutes, rules, and resolutions of Council throughout half a century relating to the stated purposes and disposal of the College funds during this time. The following recommendations of Council are therefore based upon the survey mentioned:

1. Increase current income by raising the annual contribution from 50 to 60 dollars for Resident Fellows, and from 10 to 15 dollars for Non-Resident Fellows, etc., as noted in the proposed amendment to be presented at this meeting.

2. Introduce studied legislation so that proper Ordinances and By-Laws can be prepared relative to the funds collected for endowment, future development and expansion of the College, in order to prevent repetition of Council action in regard to collected funds for various and sundry activities of the College. (In other words, it is important that the proposed legislative changes accurately and concretely spell out the purposes of these funds so that they cannot be diverted by any action of future Councils.)

3. Increase the membership of the College by a sustained program encouraging the proposal of qualified and acceptable candidates through the medium of an "Ad Hoc" Committee appointed by the President.

4. That a program for permanent endowment of the College be organized—the goal for the present to be set at 250,000 dollars. Unexpended monies contributed to the recent Building Fund, amounting to $44,802.93, and continuing to earn income in the Discretionary Common Trust Fund, might well be the beginning figure for this endeavor. Contributions earmarked during the past two years for endowment and development purposes are likewise eligible for this fund. These funds at present are as follows:

Voluntary Contributions to the Endowment Fund during 1956	6,983.76
Total to date	12,201.76
Voluntary Contributions to the Building and Development Fund during 1956	2,275.00
Total to date	3,305.00

A bequest of 5,000 dollars to the Endowment Fund, made by our former President, John H. Gibbon, Sr., is acknowledged with gratitude. I also report with sincere satisfaction that the College has received, as one of the residuary legatees of the P. Crozer Griffith estate, the sum of $38,971.21 to establish a Library Fund, the income of which has been designated for general library expenditures.

In bringing these matters before you in candid fashion, I trust that you will give due thought and consideration on the recommendations that are to be voted upon at a later date, and that you will vote to adopt the budget as presented for the reasons stated.

In conclusion, and on behalf of the elected officers and myself, I thank you for the confidence that you have seen fit to repose in us, individually and collectively.

REPORT OF THE TREASURER FOR THE YEAR ENDED NOVEMBER 10, 1956

November 10, 1956

Assets

Cash in bank and on hand—general fund (Note 1)			$10,358.89
Maintenance and reserve fund (Note 1)			
Principal cash for investment		$361.09	
Bonds		10,287.76	10,648.85
Assets held in trust funds (book values)			
Principal cash for investment		28,497.46	
Trust fund balances of income (restricted)		22,114.57	
Mortgages		50,523.96	
Bonds		286,043.46	
Preferred stocks		281,574.38	
Common stocks		383,830.79	1,052,584.62
Property			
Land—15–25 South Twenty-Second Street		95,000.00	
Building		1,420,747.93	
Furniture and fixtures		1.00	
		1,515,748.93	
Deposits on perpetual fire insurance policies		9,521.28	1,525,270.21
Total			$2,598,862.57

Funds

Unexpended income—general funds			
Library general account		$789.82	
Reserve for contingencies—uninvested portion		315.02	
Operating fund balances			
Current operating account (1)	$8,000.00		
President's room	525.00		
Publication committee	227.65		
Friends of library	20.00		
Books	53.20		
Rare books account	152.96		
Campaign expense account	350.95		
Portrait account	126.47		
	9,456.23		
Less: Overexpended balance Harvey's "De Motu Cordis" Facsimile 1628 Edition	202.18	9,254.05	$10,358.89
Maintenance and reserve fund—principal (Note 1)			10,648.85
Unexpended income—trust funds (restricted)			
Discretionary common trust fund	19,277.35		
Legal common trust fund	368.15		
Trust funds not pooled	2,469.07	22,114.57	
Trust funds principal (book values)			
Discretionary common trust fund		938,722.22	
Legal common trust fund		24,097.94	
Trust funds not pooled		15,944.89	
Special account re: purchase money mortgage secured by Northeast Corner 13th and Locust Streets property		49,500.00	
Building fund (voluntary contributions)		2,105.00	
Endowment fund (voluntary subscriptions)		100.00	1,052,584.62
Plant fund			1,525,270.21
Total			$2,598,862.57

(1) Cash in bank and on hand—general fund includes cash transferred from principal cash of the maintenance and reserve fund in the amount of $13,843.53. This transfer was made as of November 10, 1956, but was actually effected on January 4, 1957, by authorization of the Council of the College.

Statement of Income and Expenses

November 11, 1955 to November 10, 1956

Income		
On investments net of agent's fees		
Trust funds	$48,748.08	
Income funds, principal of which is not administered by the College of Physicians of Philadelphia	658.23	
Mortgage	2,290.76	$51,697.07
Contributions		
Fellows dues	45,357.50	
Life membership	571.00	
Entrance contributions	1,975.00	
Use of halls and projector	2,673.00	50,576.50
Library		12,764.18
Transfer from maintenance and reserve fund (2)		13,843.53
Miscellaneous		1,987.08
Total income		130,868.36
Expenses		
Operating expenses		
Hall committee	24,535.88	
Office of the Secretary	5,704.41	
Office of the Treasurer	5,718.95	
Pensions	1,963.39	
Campaign expenses	400.00	
Publication committee	3,853.71	
College collections committee	3,103.54	
Books	1,692.24	
Entertainment committee	1,714.33	48,686.45
Library		
Salaries and payroll taxes	44,216.42	
Books, journals, supplies, etc.	22,094.96	66,311.38
Restricted trust funds		
Discretionary common trust fund	6,216.28	
Legal common trust fund	266.92	
Trust funds not pooled	366.45	6,849.65
Total expenses		121,847.48
Income in excess of expenses		$9,020.88

(2) This cash transfer was made from principal cash of the maintenance and reserve fund to the current operating account as of November 10, 1956, but was actually effected on January 4, 1957, by authorization of the Council of the College.

Note: Receipts of special purpose funds from contributions, transfers of funds and security investments not included in the above schedule were as follows during the fiscal year ended November 10, 1956:

Fund	Amount
Maintenance and reserve fund	$4,005.89
General contributors' development fund	14,920.19
Fellows building fund	15,583.65
Building fund (voluntary contributions)	1,025.00
Endowment fund (voluntary subscriptions)	6,083.76

Jacob H. Vastine, 2nd
Treasurer

Annual Report of the Library*

ADMINISTRATIVE

The Learned Society Library

THE motto of the College of Physicians of Philadelphia, *non sibi sed toti*, suggests at once its privilege and its problem. The College library extends its services to the widest possible public but receives over 90 per cent of its support from the comparatively small Fellowship of the College. *Not for itself but for all* is an exciting objective but the exigencies of meeting the ever-increasing costs of properly operating a major medical research library suggest that financial support should come also from an ever-widening circle of informed and interested individuals and institutions.

Evidence of such widespread interest was demonstrated during the recent campaign for building funds, a large percentage of which was applied to library modernization and expansion. However, it is traditionally more difficult to raise money for endowment and operating costs than it is to secure contributions for bricks and mortar. The willingness of the Fellows to extend themselves to the uttermost limits has been demonstrated by their assumption of operating deficits of $5,000 and $10,000 for the last and the present fiscal years. If the costs of meeting further unsatisfied needs of the library were added to this amount there would be a probable gap of about $25,000 between present income and the sum required to provide optimum operating standards. An additional endowment of about $500,000 would be required to provide such an income.

A recent article by Howard Reid Craig, Director of the New York Academy of Medicine, substantiates the suspicion that these problems are not unique to the College of Physicians of Philadelphia. The small percentage of use made by those who contribute the major share of support is illustrated by New York's statement that "less than fifty per cent of the readers in the library are doctors, and of those only about twelve per cent are Fellows of the Academy. The remainder come from industry, from the lay press, free lance journalism, the entertainment world and lay scholars."[1]

The fact that readers are not required to identify themselves in terms of academic affiliation or means of livelihood prevents any precise analysis of the College library's clientele. However, the total Fellowship of the College is smaller than that of the Academy and is a smaller percentage of the local medical community. It seems reasonable to presume therefore that the Fellows' use in Philadelphia is as small or smaller a percentage of their library's use than is the case in New York.

The magnitude of the endowment required for income is indicated by the fact that the present market value of the New York Academy's cash and investments amounts to about twelve million dollars. A million and a quarter dollars of this endowment came from the Rockefeller Foundation during the 1920's[2], marking a milestone in the Academy's rapid expansion during that period.

The contention that the adequate financial support of the learned society library is a matter of national, not merely local, concern is fortified by the statistical section of the present annual report which shows that during the report year, 4,714 volumes were loaned to 187 different libraries in 27 different states, the District of Columbia, Alaska, and Canada.

The variety of institutions requiring help from the learned society library is indicated by a survey of one month's loans from the College of Physicians Library. During this period volumes were sent to 14 medical schools, 10 other academic libraries, 6 federal government agencies, 1 municipal and 2 state supported

* 1 November 1955–31 October 1956.

[1] Craig, H. R. The New York Academy of Medicine. Bulletin New York Acad. Med. second series, vol. 32: 710, Oct. 1956.

[2] Craig, H. R. op. cit. pp. 704, 708.

institutions, 6 hospitals and 6 privately supported research foundations. Eleven commercial research organizations which contribute to the library's financial support borrowed during the same period.

The gravity of this situation has been compounded by the rapidity with which costs have risen. Dr. Craig's report, referred to above, notes that the Academy's operational budget for 1939 was $256,280 of which the library received $89,352 whereas the budget for 1956 calls for the expenditure of $617,802 of which the library will receive $250,802.[2] Comparable figures for the College of Physicians show a total library expenditure in 1939 of a little over $25,000 of which $8,200 was appropriated from College operating funds. In 1957 the College has appropriated $32,391.28 toward an anticipated expenditure of $79,220.00.

Three factors suggest that the dimensions of this problem will continue to expand through the foreseeable future. (1) Government, private philanthropy, and commercial enterprise are spending more money every year on both pure and applied research in the fields of the medical sciences. Although this money is not available for the operating costs of the learned society library, it contributes directly to the growth of the literature which the library is expected to acquire, process, and make available to an ever-increasing number of investigators. (2) The mushrooming development of governmental, state supported, and industrial libraries has created a dearth of trained and experienced library personnel. This has resulted in long-overdue financial recognition of librarians all over the country but it has also harmed the privately supported non-profit institution without sufficient funds to compete for the ever-dwindling supply of trained people. The independent learned society library runs the risk of becoming either a training school for more affluent institutions or a dumping ground for the incompetent. (3) The rate of growth of the literature itself creates the need for better trained library personnel. Most scientists recognize the advisability of conducting their own literature searches but are nevertheless obliged to ask someone else to do the work for them because of the sheer bulk of pertinent information. Demands for literature reviews, bibliographies, translating and abstracting services are increasing and the efficiency of these procedures is directly dependent upon sound bibliographical procedures properly employed in the organization and servicing of our major medical research libraries.

The seriousness of this problem might be minimized if the College of Physicians Library were the only society library facing the threat of gradual deterioration through economic malnutrition or if research could progress unimpeded without vigorously developing collections of scientific data. Surely the scarcity of the older literature and the quantity of the newer makes it economically impossible for every medical research agency to develop any degree of independence. For those who care to look in the Philadelphia district alone there is evidence of hardship and fundamental damage to such libraries as the Academy of Natural Sciences and the Franklin Institute. Reports and letters from the Boston Medical Library and the New York Academy of Medicine prove that the desperate situation is not confined to Philadelphia.

The Ford Foundation recently appropriated $5,000,000 to establish the Council on Library Resources Inc. to study new mechanisms to expedite and increase the use of libraries, particularly in the field of research. However, no one seems ready to investigate methods of guaranteeing the survival of these research libraries. You cannot make more efficient use of what you do not have.

This library's 1951–52 annual report made a plea for such a study but the pressures of the building program prevented any tenacious pursuit of the objective. The library administration has pressed the Fellowship of the College as vigorously as decency permits and their response has been in generous measure. We must now join with the Fellows and turn unashamedly to the friends whom we serve for material aid, for sympathetic comprehension of the problem, and for voices raised where they will be effective.

Operation Library

The library staff will most remember this year for being the one in which the greater part of the collection was moved.

The first five floors of the stacks house the library's journals. It was decided to move all of the journals issued before 1940 to the new stacks which are more remote from the reading rooms than the old stacks. By this manoeuvre the older material which is in less active demand is in the less accessible sector of the stacks and room for growth is provided nearer at hand.

The library was closed to the public for a week in May at which time the staff members chose suitable garb and divided into three teams. Each team set about moving the pre-1940 material into the new stack. By the end of the week, the greater portion of each of three floors had been shifted. Funds made available from an unfilled position provided for temporary help to complete the shifting of four floors of the journals.

The summer witnessed the transfer of the thesis collection from seventh floor old stack to sixth floor new stack. The move revealed that there are over 1,600 linear feet of dissertations in this collection. The space left by the dissertations permitted some spreading of book material on the seventh floor relieving some badly overcrowded areas. Another phase of the shifting process was the transfer of manuscripts, incunabula and other rariora from five cages on the sixth floor to the seventh floor of the new stack which was allocated for rare book storage. Coincident with these moves was the culling by the Curator of the Library's Historical Collections of the sixteenth, seventeenth, and eighteenth century volumes from the regular stacks for safer keeping in the new rare book stack.

Not included in the above logistical account is the return of some 20,000 volumes to the stack from temporary shelving in different parts of the building where they had waited out the alterations. In most cases the shelves from which they had originally come had disappeared into elevator shafts and air ducts.

An unexpected benefit from the building alteration program was the replastering of considerable portions of the ceiling and sidewalls of the seventh floor of the old stack. The continual descent of powdering plaster had discouraged any systematic cleaning of this area. Other effects of building renovation are covered in an article by the Librarian in the June 1956 issue of the *Transactions & Studies of the College of Physicians of Philadelphia.*

Photoreproduction. The library's photoduplication armamentarium was diversified by the purchase of a Cormac machine. Funds for this purpose were received from the National Drug Company, Sharp & Dohme, Smith, Kline & French, and Wyeth Laboratories. Working in concert with existing Photostat equipment the new machine increases the versatility of this service.

Paul Judd Sartain bequest. Accumulating balances in this fund and the rather circumscribing terms governing its application led to the appointment of a special committee to explore the best means of administering the income. Dr. Burton Chance represents Council on this committee which is composed of Drs. W. Zentmayer, W. N. Bradley, and S. B. Sturgis.

Osler Library representation. The Chairman of the Library Committee who is ex officio one of the Curators of the Osler Library at McGill University, represented the College at the annual meeting of the Curators.

Exchange extension. An intensive campaign was launched during the year to expand the list of journals received in exchange for the *Transactions & Studies* of the College. Mr. Beatty instigated this project which received implementation from the Serials Librarian, Miss Zeldis, and cooperation from Dr. Fred B. Rogers who succeeded Mr. Beatty as Editor. The results of this endeavor are partially reflected in the statistical portion of this report which shows an increase in the number of journals received on exchange from 238 to 358 and a reduction in the number of paid subscriptions from 1,220 to 1,182. The length of time required to establish these contacts obliges us to wait for next year's figures to fully evaluate the results.

Open House. The library staff was pleased to participate with the Entertainment Committee

and the officers of the College in an Open House reception which was held on May 16th for inspection and dedication of the building alterations and additions. Visitors admired the new lighting in the reading rooms, marvelled at the vast expanses of new shelving in the stacks, and lingered appreciatively in the new Packard-Krumbhaar Alcove.

Duplicates. A year's accumulation of gifts of journals from a variety of sources had formed quite a mountain in the basement during the time that builders' activities precluded any processing of the material. On three different occasions librarians from Albert Einstein Medical Center, Hahnemann Medical College, Jefferson Medical College, Temple University School of Medicine, and Smith, Kline & French, pitched into the job of sorting the mountain. Temporary summer help finished the job. Visitors from as far away as Gainesville, Florida and Seattle, Washington have carried duplicates away for their libraries.

New book circulation. The College library has improvised a system to meet the paradoxical situation in which the period of greatest demand for some books is during the time when they are unavailable because of cataloging procedures. Stop gap notations are made on order records the day the book arrives so that anxious readers who have requested specific titles may have them within hours after their receipt. The volumes are specially marked so that they will be returned to their place in the processing routine after their public has been satisfied.

Freshman tours. The example which has been set so well for many years by the Woman's Medical College freshmen was followed this year by the freshman classes from Hahnemann Medical College and Temple University School of Medicine when they visited the library and the Mütter Museum. Members of the library staff escorted groups to different departments of the library where other staff members described the operations and services of those departments

Honorary Librarianship. Although the author of this section of the report came to the College too late to have much direct contact with Dr. William Egbert Robertson, the results of his influence were in evidence and testimonies to his interest were heard from both library staff and library committee members. His protracted illness, culminating in death this year deprived the library of his encouraging support. Wise counsel for the library's future was assured when Dr. Richard A. Kern was elected by the Fellowship to serve as the new Honorary Librarian.

Professional staff activity. The Philadelphia Regional Group of the Medical Library Association is currently under the chairmanship of Miss Muriel Hodge. Miss Muriel Zeldis serves on the Program Committee of this group and Miss Lillian Ceci served on the Membership Committee, 1955/1956.

The Medical Library Association enjoys the services of Mr. William Beatty as the Editor of its *Vital Notes.* He is also chairman of the Committee on Periodicals and Serial Publications. Mr. Elliott Morse is a member of the Committee on Gifts and Grants and represents the association on the Joint Committee to Study Relations between Libraries in the United States and the Federal Government. Mr. Morse represented the College at the Medical Library Association convention in Los Angeles.

The Employment Committee of the Special Libraries Council of Philadelphia and Vicinity was under the chairmanship of Mr. William Beatty while he was in this area. Mr. Elliott Morse served as Managing Editor of the *Bulletin* published by the Council until June of 1956.

Miss Muriel Zeldis successfully fulfilled the requirements for the master's degree in library science at Drexel Institute of Technology. Miss Elizabeth Colabrese is continuing her studies for the degree.

Mr. Morse wrote an article for the *Transactions & Studies of the College* summarizing the results of the College's building program. He serves on the Board of Trustees of the Narberth Public Library.

Personnel changes. Mr. William Beatty resigned in the middle of the year to accept the Librarianship at the Medical School of the University of Missouri. Miss Josephine Walsh was appointed Assistant Librarian in charge of

Readers' Service. She is a graduate of George Washington University and received her library science degree from the University of Denver. Miss Walsh was employed at the University of Colorado Medical Center before coming to the College.

Mrs. Virginia Beatty's resignation from the Directorship of the Medical Literature Service is noted in that section of this report.

Miss Elizabeth Colabrese was transferred from the Serials assistantship to the newly created assistantship in the Reading Room. Miss Dorothy Minton was promoted from a library paging position to the Serials assistantship following the resignation of Miss Marguerite Wiberg.

Mrs. Jean Stevens' appointment as Executive Secretary of the Medical Literature Service is reported in the appropriate section.

Benefactors. A list of the donors of books and other library materials appears in the statistical section of this report. A special grant was received from the Eberhard Foundation to enable the library to subscribe to Chemical Abstracts Service.

The library is pleased to report the following institutional subscriptions to the support of the library made under the Contribution Plan:

Merck Sharp & Dohme
National Drug Company
Smith, Kline & French
Wyeth Laboratories
McNeil Laboratories, Inc.
Air-Shields Inc.
J. T. Baker Chemical Co.
Barnes, Dechert, Price, Myers & Rhoads
Bernstein & Bernstein
Chew, Harvey, & Thomas
Decker Aviation Corp.
E. I. du Pont de Nemours Haskell Laboratory
E. I. du Pont de Nemours Lavoisier Laboratory
Eaton Laboratories
Freedman, Landy, & Lorry
Gray & Rogers
Klinger & Mann
La Wall & Harrisson
Lee Ramsdell & Co.
Lemmon Pharmacal Co.
MacAndrews & Forbes Company
Norwich Pharmacal Co.
Oxy-Catalyst, Inc.
Pennsylvania Railroad Co.
Philadelphia Ampoule Labs.
Quaker Chemical Products Corp.
Richter, Lord & Levy
Rittenhouse Book Store
Rohm & Haas Company
Samson Laboratories
Squibb Institute for Medical Research
Henry K. Wampole & Company, Inc.

E. H. M.

MEDICAL LITERATURE SERVICE*

During its three years of operation, the Medical Literature Service has proven its value in providing extensive reference and research assistance to members of the medical and allied professions. In 1956 many individuals contacted the Service for literature searches, bibliographic assistance, translations and abstracts. The smaller medical libraries in the Philadelphia area frequently refer their patrons to M. L. S. for reference and bibliographical services which require more time than they have available or which require the use of materials not in their libraries. The Medical Literature Service has established contacts with free-lance research workers who are competent to perform specialized bibliographical operations. Full time staff members supervise this work and make necessary arrangements.

The College Library absorbed the Medical Literature Service as a department of its Readers' Service Division after Mrs. Virginia Beatty, original Director of the Service, resigned in May 1956 to accompany her husband to Columbia, Missouri. Mrs. Jean Stevens, formerly Assistant to the Director, was made Executive Secretary and Mr. Robert Blanken of the Department of Biochemistry of the University of Pennsylvania was added to the staff on a part time basis. Dr. A. Tillema van Ormandt again ably assisted in translating and abstracting projects.

In the latter part of the year, attempts to further publicize the existence and facilities of

* The contracted bibliographical services of the library are currently offered under the name, Medical Documentation Service of the College of Physicians of Philadelphia.

M. L. S. have been made by sending informative literature to many pharmaceutical companies. It is hoped that these efforts will gain additional clientele to put the Service on a sound financial basis.

During the period covered by this report: 22 subjects have been registered with the Service by clients requesting regular reports of articles appearing on a particular subject; 379 foreign language and 356 English language articles were annotated. Sixty two literature searches were made and 129 translations were completed.

The most important contribution of M. L. S. continues to be the provision of another means through which the vast resources of the College library are being more fully utilized in the interests of medical research.

J. A. W.

HISTORICAL

Packard-Krumbhaar Alcove and New Stacks

The College's "Open House" on 16 May 1956 disclosed to its Fellows and other friends impressive miracles that had been brought to pass through the twin genii of generosity and perseverance in the past half-dozen years. One of them, the creation of the Packard-Krumbhaar Medical History Alcove, at the west end of the Norris (periodicals) Room, honors not only the two past-presidents whose names adorn it, but, no less, the whole gallant troop of the history-minded who have endowed the College with the enviable historical collections that have created the pressing need for commensurate specialized attention. The Alcove provides (besides comfortable chairs, and work-tables) the major reference tools, with partial guides to their precise location on the shelves. Catalogue drawers are in place, into which cards for newly accessioned works of historical interest are finding their way; in time, they will contain cards for the major part of the secondary sources available in the library, as well as auxiliary indexes to be compiled in the future. A vacant desk hopefully bespeaks the ultimate presence of a second staff member dedicated solely to Clio Medica, while the origin of the local species is conveniently based in the room adjoining the Alcove. Of the pictorial furnishings, the most immediately remarkable is a handsome plaque (Otto Schweizer, sculptor) of S. Weir Mitchell, one of the most notable of the earlier cultivators of the College's historical vineyards. This, including its most appropriate placement in the Alcove, the College owes to the beneficence and historical interests of its President, Dr. Lewis C. Scheffey.

But the Packard-Krumbhaar Alcove is not the sum of the recent miracles affecting this area of the library's activities. The 7th floor of the new stack wing provides, for the first time, suitable accommodations for the thousands of rare books and manuscripts themselves, the primary materials of historical study. Three groups of this material—the incunabula, the manuscripts, and the books in the Lewis Room—required merely transportation and re-shelving, because they had long been segregated. They were promptly re-located, once the new stacks became available. The great majority of the rare books, however, scattered throughout the old stacks, must be carefully culled, transported to their new home, and there carefully re-shelved—a not inconsiderable task, in view of their numbers and the lack of a bibliographical Geiger counter. Fair headway having been made at this time, there is no reason to suppose that this work will not have been completed well before this time next year.

Fugitive Leaves

As a further means of stimulating interest in the history of medicine in general, and in the too-little-known riches in our historical collections, in particular, publication of the informal, mimeographed *Fugitive Leaves* was resumed in January, 1956, after an interval of nearly 19 years. With one exception (not within our control), a *Leaf* has accompanied every issue of the library's *Booklist* since then. No. 1, because it appeared in the month of the world-wide Benjamin Franklin celebrations, used a deceptive facsimile Franklin letter in our Gilbert Collection to draw attention both to that great

collection of manuscript letters and to the College's other contributions to the celebration; Nos. 2–4 gave first publication to the original Latin manuscript of the oration delivered by John Lawrence at the first medical Commencement in this country (1768)*, with a translation of it by Mr. William K. Beatty, then one of our assistant librarians; No. 5 presented an annotated list of the remarkable group of books exhibited on the occasion of the College's "Open House"; No. 6 made known the library's possession of one of the very few known extant copies of the trial printing, in 1794, of Thomas Percival's *Medical Ethics*, which was not formally published until 1803; No. 7 began a 3-issue inventory of the Hering Paracelsus Collection, to be mentioned further below. Techniques dropped and resumed, like warmed-over fare, seldom emerge from hibernation with their pristine values still in evidence; when they do, as appears to be the case with the vagrant *Leaves*, the aura of a small miracle seems, to the operator, to hang over the event.

The Hering Paracelsus Collection

A notable example of community coöperation was the depositing in this library, by the Hahnemann Medical College and Hospital, of its splendid Paracelsus Collection, gathered together by Constantine Hering (1800–1888), pioneer homeopathist. To widen knowledge of its contents by scholars in this country and abroad, the *Fugitive Leaves*, as noted above, published a concordance relating the separate editions, by number, to the basic Sudhoff *Bibliographia Paracelsica*, with supplementary references to the holdings of the Schlueter Collection, in St. Louis, and of the College, and a short-title list of non-Sudhoff items in the Hering Collection. As thorough cataloguing of the Hering Collection must await the acquisition of additional personnel, it is hoped that the information thus provided may facilitate use of the collection, by scholars and staff, in the interim.

* The text, provided with a new translation and commentary by Dr. Herbert J. Dietrich, Jr., a Fellow of the College, is to be published in the June, 1957 issue of the *Transactions & Studies*.

Society Archives

As every research library knows, one of the most useful (and difficult to augment) categories of its historical materials is that of society archives. All rests on the historical sensitivity of the party of the first part. One society, flexing its muscles at discovering suddenly that it is approaching its 50th birthday, resolves to celebrate the event fittingly and, when the dinner has been arranged, appoints one of its members to prepare a history of the society. Whether his memory goes back all of the way, or only a part of it, it is not long before he wishes to refer to the minutes and other records; unfortunately, they prove unavailable, and nobody knows when or how they became so. On the other hand, another society, when the time comes, is able to produce a comprehensive and authoritative history of itself because some of its officers, at least, have sensed the irreplaceable nature of these records and taken steps to preserve them. The easiest, as well as the most judicious, of these steps, obviously, is to deposit them in the nearest appropriate library, as soon as they are not needed for the current conduct of the society. Our library has the archives of a few of the older local medical societies, but continuously solicits similar deposits by other societies. The occasion for this little homily, it is pleasant to report, was the receipt, from Dr. Lewis C. Scheffey, of additional valuable records of the Obstetrical Society of Philadelphia; and, at the instigation of Dr. Elizabeth Kirk Rose, President of the Philadelphia Pediatric Society, of the archives of that equally historically sensitive society.

Other Acquisitions

Under this rubric, the name of Dr. E. B. Krumbhaar must once again take precedence, for from him was received the final installment of books in his historical library that had been selected as known additions to the resources of the College library. Under different circumstances, there might have been a large alcove containing nothing but the valuable and useful books donated by him in the past four decades and

more; but, whether in the "working" or the historical areas of the library, an examiner of provenances will not, for a long time to come at least, pick up many books without remarking on the frequent recurrence of this name.

The library itself purchased a number of 16th and 17th century books whose interest could readily be documented, but attention at this time may be directed to some manuscript acquisitions and other donations made or suggested by some of the library's thoughtful friends.

The most unusual of these manuscript acquisitions, doubtless, are two Mexican ones, for which we are indebted to the unfailing generosity of our Fellow Dr. J. Monroe Thorington. One is a 7-page manuscript, dated 1715, in which the leading medical professors at the University of Mexico set forth the examination in physiology which a student (named) had just successfully taken. The other, a document of 5 pages, dated 1717, signed by the same professors, has to do with the laws regulating the practice of medicine in Mexico. The *Fugitive Leaves* (as doubtless more imposing periodicals) would warmly welcome translations of these manuscripts by a Fellow or another prepared to cope with Mexican-Spanish chirography of the early 18th century. Our Mexicana medica collection (which already contains some choice items in this little cultivated, but historically interesting, field) was further enriched by the acquisition of the following rare printed works: 1) Flores, José. Especifico nuevamente descubierto en el reyno de Goatemala, para la curacion radical del horrible mal de cancro. Mexico, 1782; 2) Puebla. Academia Medico-Quirurgica. Ensayo para la materia medica Mexicana. Puebla, 1832; 3) Zeschan Noamira, José Ramo. Memoria instructiva sobre el maguey o agave Mexicano [a plant producing an alterative, laxative, and diuretic juice]. Mexico, 1837.

Acting on the suggestion of their brother, our Fellow Dr. John B. Flick, the daughters of the late Dr. Lawrence F. Flick supplemented our very valuable and useful *Flick Collection* with 50 well-bound volumes of letters (many of them from highly distinguished persons) received by Dr. Flick and bearing on the subject with which his name will always be associated—tuberculosis. The *Joseph Walsh Collection*—another mine of historical source material on this subject—was augmented by 3 volumes of Dr. Walsh's papers.

Our late Fellow *Dr. Reuben Friedman* bequeathed to us his apparatus for the most widely known of his historical studies, that on scabies. The material consists of 5 printed monographs; 8 bound volumes of reprints; and 16 bound volumes of photostatic reproductions of books and articles. Through the kind mediation of *Mrs. F. Maurice McPhedran*, we were presented, by *Miss Anna Hartshorne*, with two large boxes of manuscript and printed materials relating to the professional career of *Dr. Henry Hartshorne* (1823–97), distinguished physician, scientist, and teacher, and for 46 years a Fellow of the College.

The only substantial history of the College was written by one of its Presidents, *Dr. W. S. W. Ruschenberger*, for the College's centennial celebration, in 1887. For nearly 69 years, Dr. Ruschenberger was a member of the Medical Corps of the U. S. Navy; he made several long voyages, records of which are incorporated in the three books he published: *Three Years in the Pacific; A Voyage around the World*; and *Notes and Commentaries during Voyages to Brazil and China*. Not one of these books, nor any of his papers, was to be found in the library until we purchased, in the past year, three highly interesting Ruschenberger manuscripts (including scrapbook material) that unquestionably served as source material for at least the first two of his books. Copies of the books themselves would be warmly welcomed, we need hardly add.

Other manuscripts:

Cruice family. In the library of our late Fellow, Dr. John M. Cruice, which came to us following his death, through the kindness of his Estate, there are papers dealing with members of the family in three generations: Mr. James P. Cruice; his sons Dr. John J. and Dr. Robert Blake (a Fellow of the College); and his grandson Dr. John M. (also a Fellow). The material contains useful Civil War medical documents

and others applicable to the history of St. Joseph's Hospital, in this city.

Brandner, G. H. Manuscript receipt book (1840) of a Pottsville physician.

Chapman, Nathaniel. Notes on Chapman's lectures, taken by Jacob Jeanes (1800–77), 1821–22. Contains a pencil sketch of Isaac Hays. Jeanes received his M.D. degree from the University of Pennsylvania in 1823, practiced allopathy for 12 years; later, was a founder of the Homeopathic Medical College of Pennsylvania and its first professor of medicine.

Jackson, Samuel (1787–1872). "Notes of a Course of Lectures on the Materia Medica by Sam[1] Jackson MD AD 1826.7.8. To Which Are Added Three Lectures on the Stethoscope, by the Same—AD 1827—vol. 2nd". These lectures —the 33d through the 54th, reported with unusual fullness—were probably delivered at neither the Philadelphia College of Pharmacy nor the University of Pennsylvania, but at Nathaniel Chapman's Medical Institute. The volume contains ownership scribbles of two medical graduates of the University, 1829—Richard Maris and Robert R. Dorsey. This constitutes the library's only documentary record of the classroom teaching of this learned, wise, and popular professor. We shall hope to find and obtain this volume's mate, vol. 1.

Morris, Caspar (1805–84). Medical notebooks. 2 vols, 1824, 1836. An interesting spaced record of this physician, hospital administrator, and poet, who was graduated M.D. from the University of Pennsylvania in 1826.

Wood, George B. (1797–1879). "Journal 1st", 1817–29. In our report last year, we noted the gift of Dr. Wood's "Journal No. 3rd", 1836–49. Parts of this "Journal 1st", a very welcome addition to the Wood Room presented by Mrs. George B. Wood, were privately printed some years ago by Mrs. Wood and her husband as a Christmas souvenir for the family.

Other donations of an historical nature, gratefully received, were:

Darlington, William. Flora cestrica. 3d ed., 1853. Presented by Mrs. A. C. Barnes, at the suggestion of our Fellow Dr. Harry P. Schenck.

Fisher, John D. Description of the . . . small pox . . . and chicken pox. Boston, 1829. Presented by our Fellow Dr. Milton Frazer Percival.

Monro, Alexander. Anatomy of humane bones. Edinburgh, 1726. Presented by Miss Martha Zerfoss, at the suggestion of our Fellow Dr. Nicholas Padis.

Sylvius, Franciscus. Opera medica. Amsterdam, 1680. Presented by the Misses Margaret, Emily P., and Caroline (dec.) Silvis, at the suggestion of our Fellow Dr. George M. Coates.

Virchow, Rudolf. La pathologie cellulaire. Paris, 1861. Presented by Mr. Walter Kahoe, at the suggestion of the Vice-President of the College, Dr. Jonathan E. Rhoads.

Exhibits of the Year

These comprised: 1) notable first editions of 50, 75, 100, 200, and 300 years ago; 2) an exhibit illustrative of the history of the Section on Medical History during its first half-century; 3) an exhibit of editions of Sir Thomas Browne's works, arranged in connection with the Kate Hurd Mead Lecture (Woman's Medical College of Pennsylvania) on Browne, delivered by Dean Jeremiah S. Finch, of Princeton, under the joint sponsorship of the Woman's Medical College and our Section on Medical History; 4) a Sigmund Freud commemorative exhibit, in which we had the very helpful coöperation of our Fellow Dr. Robert S. Bookhammer; 5) the "Open House" exhibit noted above; and 6) an exhibit in connection with the symposium on "Faith and Healing" presented by the Section on Medical History.

Other Curatorial Activities

In connection with the Franklin celebrations, the curator prepared a paper on Franklin's views on longevity for distribution by the Franklin Committee, and read a revised version of it at the Franklin meeting of the Section on Medical History; another paper, on Franklin and medicine, was prepared for, and published in, the *Daily Pennsylvanian*'s Founder's Day Issue. An address delivered at the semi-centennial meeting of the Section on Medical History, "Expanding the use of the library's historical collections", was published in the February,

1956, issue of the College's *Transactions & Studies*. A short tribute to Dr. W. W. Francis, Librarian of the Osler Library, Montreal, appeared in a volume of tributes offered to him on the eve of his 78th birthday. An article on the late Mr. James F. Ballard, Director of the Boston Medical Library, appeared in the January, 1956, issue of the *Bulletin of the Medical Library Association*; and a paper entitled "Bibliotherapy—some historical and contemporary aspects" in the October, 1956, issue of the *ALA Bulletin*. Two articles were prepared for the *Dictionary of American Biography*, while the *Bulletin of the History of Medicine* and the *Journal of the History of Medicine* were provided with a book-review each.

Dr. William Egbert Robertson

From 1934 until a few months before his death (9 March, 1956), Dr. Robertson served the College continuously as a member of the Library Committee, for part of the time as chairman, and, latterly, as the Honorary Librarian. One who served under him throughout that period records with gratitude, and an understandable sense of loss, the memory of his faithful discharge of these responsibilities, his progressive intellectual outlook, based on wide reading and scholarly interests, his sense of humor, and, not least, his sympathetic understanding of human problems. A Fellow charged with the responsibilities that were his may discharge them effectively in any number of ways, of course. Dr. Robertson's was a modest, unassertive way whose effectiveness—unfortunately, for historical purposes—is less likely to show up in the minutes than in the memories of those whose actions were subtly influenced by the warmly human example he set.

W. B. McD., 2d

STATISTICAL SUMMARY

Inventory

		1956		*1955*
Total number of accessioned[1] items		192,679		189,542
	1956		*1955*	
Incunabula	(421)[2]-419		(421)[2]-419	
Manuscripts (including a few typescripts)	879		799	
General	187,036		183,991	
Accessioned pamphlets	4,345		4,333	
	192,679		189,542	
Total number of unaccesioned[1] items		328,828		326,615
Reports	28,579		28,290	
Periodicals "reserve"[3]	10,935		9,542	
Theses and Dissertations	58,340		57,678	
Pamphlets and reprints	231,094		231,105	
	328,828		326,615	
Total number of current periodical publications and serials regularly received	2,116		1,977	
Portraits[4]	98,777		94,572	

[1] Accessioned items in this library comprise the total number of bound volumes and such unbound pamphlets as have been catalogued as separate bibliographical units regardless of their size.

There remain many thousands of unaccessioned pamphlets awaiting accessioning and cataloguing. A true quantitative and qualitative picture of the library's holdings can not be presented until this wealth of neglected material has been processed and duly registered in our 'accessioned', or 'volume', count.

[2] Difference due to several titles bound together and assigned one accession number.

[3] More-or-less complete duplicate volumes of periodicals.

[4] Including 123 oil, and 280 other, framed portraits in the care of the Committee on College Collections. The count of portraits represents the number of entries on the cards in the portrait catalogue. The entries represent, in turn, both loose portraits and those in books, many of them, of course, being merely different reproductions of a single original.

Distribution of This Material

	Accessioned Items	*Unaccessioned Items*
General Library	188,296	328,824
On permanent deposit:		
Gross Library	3,966	4
Parry Library of the Obstetrical Society of Philadelphia	217	0
Mütter Museum[5]	200	0
	192,679	328,828

Current Serials

	Subscription	*Gift*	*Exchange*	*Total*
U. S. A.	340	350	117	807
Western European Continent	628	47	69	744
Latin America and West Indies	22	78	82	182
United Kingdom and Eire	124	22	19	165
Canada	9	18	7	34
Eastern European Continent	23	6	5	34
Asia (including Japan)	16	45	36	97
Africa	4	2	12	18
Pacific (including Australasia)	3	7	11	21
United Nations	13	1	0	14
Grand Total: 1956	1,182	576	358	2,116
Grand Total: 1955	1,220	519	238	1,977

New titles: A total of 67 serials was added in 1955–56. Eleven of these were purchased; fifty-six received in exchange or gratis. The greater gain in grand total than in the number of new titles added is due to reactivated titles which were not being currently received last year.

Separate Issues received, checked-in on the cards, and shelved totaled 16,865. In addition, thousands of duplicate issues were received as usual; 1,393 of these were retained in our 'reserve' files, no attempt being made to count those held merely for exchange or other use.

Visitors in the Norris Room for the year totaled 3,448.

Readers' Use of the Library

Library Hours. The library was open, during the academic year, from 9:30 to 9:30 on Mondays and Wednesdays; from 9:30 to 5:30 on the other weekdays. During the latter half of June, in July, August, and the first half of September the Library was open from 1 to 9:30 on Tuesdays; from 9 to 5 on the other weekdays, except Saturdays, when it was closed. The following legal holidays were observed: Thanksgiving, Christmas and New Year's (and the half day preceding each), Memorial, Independence, and Labor Days.

Visitors:

	Totals	*Reading Room*	*Periodicals Room*
1956:	11,500	8,052	3,448
1955:	10,732	8,483	2,249

Circulation:

	Totals	*Intra-mural*[6]	*Extra-mural*[7]	*Books*	*Journals*
1956:	37,397	26,088	11,309	6,934	30,463
1955:	45,253	33,481	11,772	8,391	36,862

[5] The books of the Mütter Museum are not permitted to be removed from the College building.

[6] The number of volumes "consulted in the library" includes only those supplied on demand. Readers have access to the bound volumes of periodicals and reference works kept on the shelves in the Reading Room; the Fellows, and occasionally others, by special permission, have access to the book-stacks. There are, therefore, many volumes consulted of which no accurate record can be kept.

[7] This figure includes 783 unbound current issues circulated from the Periodicals Room.

Inter-library loans: The library sent 4,714 (1955: 3,532) volumes on inter-library loan to 187 (1955: 129) libraries in 27 (1955: 28) States, Washington, D. C., Canada, and Alaska and has borrowed 5 (1955: 4) volumes from 3 (1955: 2) libraries.

Photostats and Cormac Sheets: 4,648 Photostat and Cormac prints were furnished on request (1955: 4,309).

Acquisitions and Accessions

Accessioned Acquisitions:

1956: 3,137 volumes (1,993 by purchase; 937 by gift; 195 by exchange). (*Books:* 1,105; *Periodicals:* 2,020); 12 pamphlets.

1955: 2,688 volumes (1,708 by purchase; 734 by gift; 233 by exchange). (*Books:* 832; *Periodicals:* 1,843); 13 pamphlets.

Non-accessioned Acquisitions[8]*:*

1956: 289 Reports (1955: 275)
662 Theses (1955: 512)
250 Miscellaneous items (1955: 324)

Donations

The donors for the past year number 208 (1955: 208). The library is indebted for large gifts of books, pamphlets, and unbound periodicals to the following donors: Dr. S. Bellet; Hahnemann Medical College Library; Jefferson Medical College Library; Drs. R. A. Kern, E. B. Krumbhaar; J. B. Lippincott Co.; W. B. Saunders Co.; Smith, Kline & French Laboratories; Temple University Medical School Library; Dr. I. J. Wolman.

Various publishing houses, among the large group of corporate donors, have presented volumes as follows: F. A. Davis, Co., 4; Lea & Febiger, 17; J. B. Lippincott Co., 44; W. B. Saunders Co., 62.

Other individual donors were as follows: Prof. J. Q. Anderson, Drs. R. Archilla, M. B. Asbell, G. M. Austin; Mrs. A. C. Barnes through Dr. H. M. Schenck; Drs. W. Bates, O. V. Batson; Mr. W. J. Bell, Jr.; Drs. M. S. Biskind, N. Blumberg; Dr. C. W. Bonney Estate; Drs. R. S. Bookhammer, W. N. Bradley, F. T. Callomon, M. Castallo, W. E. Chamberlain, B. Chance, G. Clayton, G. J. Connor, T. A. Cope, E. F. Corson, J. M. Cruice, J. R. Elkinton, C. B. Farr, W. T. Fitts, F. Fraley, T. S. Githens; Mrs. D. M. Luehrs; Drs. B. L. Gordon, F. C. Grant, C. M. Gratz, P. Hartman, W. P. Havens, Jr., E. Hess, D. Hinkson, H. Hopkins, J. C. Howell, R. J. Hunter, R. H. Ivy; Mr. E. R. F. Johnson; Drs. J. V. Klauder, H. S. Klickstein, D. W. Kramer; Miss O. E. Lang; Mr. W. B. McDaniel, 2d; Dr. C. Macfarlane; Mr. R. R. McGoodwin; Drs. H. J. Mezger, C. W. Mucklé; Mrs. G. H. Nofer; Drs. H. W. Orr, G. E. Pfahler, H. Pleasants, Jr., S. X. Radbill; Mrs. S. Rappaport; Drs. J. Rhoads, J. Rogers, I. C. Rubin, L. C. Scheffey, T. G. Schnabel, G. Schwarz, L. M. Sellers, W. B. Shelley; Misses Margaret, Emily, and Caroline (deceased) Silva through Dr. G. M. Coates; Drs. J. A. Sterling, C. N. Sturtevant, J. H. Talbott; Mrs. J. B. Tate through Dr. D. M. Davis; Drs. J. M. Thorington, L. M. Tocantins; Mrs. R. B. Twining; Mrs. C. T. Urbach; Mr. H. W. Wells; Mrs. G. B. Wood; Miss Martha Zerfoss through Dr. N. Padis. The *Transactions & Studies* was sent, either in exchange or as gift, to 398 organizations.

The library received a number of journal issues through gifts and supplied duplicate journals to other libraries through a variety of channels.

Theses and dissertations to the number of 662 have been received on exchange from the following European schools of medicine: Universities of Basel, Bern, Copenhagen, Erlangen, Geneva, Lausanne, Leiden, Louvain, Lund, Tübingen, Uppsala, Utrecht.

[8] As usual, not all the pamphlets, theses, and numbers of various journals listed as received had been checked for keeping or discard at the close of the library year.

Annual Report of the Committee on the Mütter Museum and College Collections

THE Mütter Museum is open daily with the exception of Saturdays and Sundays from 9.30 A.M. to 1.00 P.M. and from 2.00 P.M. to 4.30 P.M., and until 8.30 P.M. on the Stated Meeting Nights of the College, with the curator in attendance.

The year 1956 was a busy and a rewarding one for the Mütter Museum. There were 1851 visitors during the year, many coming in groups. Among these were classes from the South Philadelphia High School, freshman classes from the Hahnemann Medical College, Woman's Medical College, and Temple University School of Medicine, students from the Franklin School of Science and Arts, and Miss Cute's class of Occupational Therapy from the University of Pennsylvania. Dr. Samuel X Radbill also brought his graduate class in pediatrics for a session in the Museum, using many of the exhibits to show ancient instruments that were once used in the practice of medicine.

In January of this year an illustrated article on the College and Museum appeared in the magazine section of the Sunday Inquirer and this is still bringing many lay visitors to the Museum and College. The Museum was also further publicized by an exhibit of photographs and articles on Museum exhibits at the International Academy of Pathology Convention in Cincinnati the week of April 24, 1956. Mr. Sunner, the photographer, exhibited the material for us in the same manner in which it was displayed at the American Medical Association Convention in Atlantic City in June of 1955.

Dr. William Pierce Boger, Medical Director at *Sharpe and Dohme*, spent one day in the Museum photographing many of the stethoscopes in the collection which he some day expects to use in an exhibit showing stethoscopes from all over the world.

The 69th Thomas Dent Mütter Lecture was delivered on October 3, 1956 by Dr. Harry S. N. Greene, Anthony N. Brady Professor of Pathology and Chairman of the Department of Pathology at Yale University School of Medicine. His subject was *The Significance of Transplantability.*

One hundred articles on Museum subjects written by the curator have now been completed and together with some of the illustrations are being submitted to publishers for consideration.

The Museum, as usual, received articles for the permanent exhibit. *Dr. John H. Willard* presented a French hematimeter.

A Fleischl's hemoglobinometer came from the estate of *Dr. John M. Cruice* and *Dr. William N. Bradley* presented an antitoxin hypodermic set in use in 1910 for diphtheria.

Dr. Truman G. Schnabel contributed two of Southey's tubes, one silver and one ivory.

Sharp and Dohme through *Dr. Henry S. Thomas* presented a beautiful replica of Edward Jenner's vision-tester.

The Museum is still receiving compliments on the new lighting system and on the additional exhibition room.

Mrs. Ella N. Wade was reappointed curator for the year 1956–1957.

THE COLLEGE COLLECTIONS

The collections of the College were also considerably augmented by donations during the year. One gift of which the College is justly proud is the Congressional Medal presented by *Mr. C. L. Jordon*, Vice-President of the Franklin Institute and Chairman of the International Franklin Anniversary Committee. This is a bronze medal of Benjamin Franklin struck to commemorate the 250th anniversary of his birth, designed by Laura Gardin Fraser.

Dr. Lewis C. Scheffey, President of the College, presented a beautiful plaque of Dr. S. Weir Mitchell by Otto Schweizer which is displayed on the wall in the Packard-Krumbhaar Alcove.

An oil portrait of Dr. O. H. Perry Pepper by Sean O'Sullivan of the Royal Hibernian Acad-

WORK OF THE CATALOGUERS

	1956	1955
Accessioned items catalogued or recatalogued	902	846
Unaccessioned items and Fellows' reprints catalogued by author or by author and subject	392	77

THE STAFF

Librarian
Elliott H. Morse

Assistant Librarian
Readers' Service Division
Josephine A. Walsh
Readers' Service Division Assistant
Elizabeth Colabrese
Serials Librarian
Muriel Zeldis

Assistant Librarian
Preparation Division
H. Muriel Hodge
Assistant Cataloguer
Lillian Ceci

Serials Assistant
Dorothy Minton

Secretary and Preparations Assistant
Mrs. Kathryn E. Miragliotta

Curator of the Library's Historical Collections
W. B. McDaniel, 2d

Medical Documentation Service
Mrs. Jean C. Stevens, Executive Secretary

Pages
Loretta Gilliam
Joan Kahler
Louise Sanders
Ella Wallace

Approved:
BURTON CHANCE
Chairman

ELLIOTT H. MORSE
Librarian
W. B. MCDANIEL, 2d
Curator of the Library's Historical Collections

emy was presented by *Dr. Pepper* and now hangs in Mitchell Hall with other portraits of past presidents.

Dr. George W. Norris contributed a spring lancet that was used by his grandfather, Dr. George W. Norris (1808–1875).

Dr. J. Monroe Thorington, as usual, contributed generously. This year his gifts consist of medals of Dr. Jonas Salk, Abbé De L'Epée, Edward Jenner and Bernard Jussieu; votive offerings, namely, metal breasts of 1820 from Seville, Spain and a metal leg of 1790 also from Seville. Wax eyes, modern but from an ancient mould, came from Barcelona. From Styria, Austria, *Dr. Thorington* brought a wood carving of 1780 illustrating circumcision, and a marten's jaw articulated with silver, possibly a charm, dated 1800.

Dr. Burton Chance, also a generous donor, presented us with a pocket case of ancient lancets that formerly belonged to Dr. William F. Norris and a metal case containing needles and surgical thread.

A bronze medal of Jacobus Berzelius which was not in the collection was presented by *Dr. Fred B. Rogers*, and a badge of the International Society of Hematology Congress held in Boston in August 1956 was the gift of *Dr. Irving J. Wolman.*

Mrs. Robert Charr presented a unique silver case of hypo-units that at one time belonged to Dr. Thomas McCrae.

Dr. Samuel X Radbill added an insignia worn by physicians in war service to the collection.

The following oil portraits were restored by Mr. Frank Ireland: Washington L. Atlee, Edward Jenner, George W. Norris, William Fisher Norris, Benjamin Rush and Thomas Sydenham.

Mrs. Ella N. Wade was reappointed custodian of College Collections for the year 1956–1957.

THEODORE F. BACH
Chairman

Memoir of Joseph C. Yaskin (1891-1955)*

By BERNARD J. ALPERS, M.D.

A LITTLE over a year ago, on August 10, 1955, Joseph C. Yaskin died. His story has already been told so I shall confine myself therefore to an appreciation of him as a man of medicine. His life is an example of the best in the tradition of American democracy, and only those who have walked with him along his destined path can appreciate all that he experienced. Not that he would have regarded his life as spectacular or extraordinary; only that it serves as an inspiration for those who follow in his path and who are fortunate enough to scale Olympus by the determination and devotion to service which he exemplified.

He came to America as a young immigrant boy, and by hard work rose to be one of the most respected clinical neurologists in our country. He was at the time of his death, Professor of Neurology in the Graduate School of Medicine of the University of Pennsylvania, the Nestor of Philadelphia neurology. For many years before he passed away he was regarded as the finest example of that Philadelphia tradition which included among its names Mills and Spiller and Frazier and Dercum. To those of us who worked under him and with him he was an example of a past glory, for he combined in his medical attributes features which some of us would have given much to be able to achieve; glories which were the heritage of a changing tradition and yet were the foundations of a solid clinical approach to his chosen field.

He entered neurology through general medicine and for years was a family doctor with a devoted following—before he became an illustrious consultant. For this reason, unlike most of us who were his colleagues, he had a sound background in clinical medicine. And while his opinion was much sought after as a neurologist, it was equally regarded in medicine, in which his knowledge was as broad as his acquaintance with nervous disease. His understanding of his specialty, moreover, was buttressed and enhanced by his knowledge of general medicine. He was at times an exasperating friend for he believed, I think somewhat quizzically, that diagnoses could be reached instinctively by a smell, or a passing glance, or even by intuition. Some of us who knew him well spent many hours in argument with him over the art versus the science of medicine. He was a great believer in the role of the art of medicine in gifted clinicians, for he himself was one of its outstanding examples. What he meant, of course, was that an intelligent and superior intellect could unconsciously piece together on the basis of wide experience observations which those of us with less rich background found it hard to correlate.

He was an inspiring teacher, but he was not an investigator. Writing was difficult for him. He was too occupied solving problems for other physicians to have either time or energy for formal investigation. But though his skills lay along other lines, he still had time for research. I can think of no studies which he made which failed to add to our understanding of the problems which occupied him. He was primarily a clinician, however, and it is as a clinician and teacher that he made his greatest contributions, for it was in this sphere that his talent asserted itself. He knew clinical neurology intimately and personally. His knowledge was broad and penetrating so that he was able to recognize what was pertinent and what was impractical in other fields pertaining to his specialty. Those of us who sat next to him at national meetings can still recall his asides at pertinent points of presentations which displeased him.

* Read before the College of Physicians of Philadelphia, 5 December 1956.

Prepared and published at the request of the Council of the College of Physicians of Philadelphia.

Dr. Yaskin was intimately acquainted with all that was going on in his specialty, and he had the knack of every superior teacher of knowing and applying what was related to his subject. He was practical yet inspiring and like a good teacher he knew how to be dogmatic without being arbitrary and without discouraging argument. His clinical conferences were an example of the best in the Socratic method, and my memory of them when I was participating in them, was that all opinions were welcomed and no holds barred. Those who have followed him have tried to pursue the methods which he so brilliantly exemplified.

Of his gentle nature only those of us who lived with him can testify. He was a kind and tolerant man. He could be impatient and could be roused to anger, but it was not in him to be mean, and in many years of friendship I never knew him to be vindictive. He was sensitive and sometimes easily hurt, but he was forbearing and compassionate with those who needed his help and he could be critical of his equals who erred in observation or practice. He was not one for hero-worship; he had those whom he admired, but they were not men in his own specialty. They were rather, masters of general medicine—men of the stature of David Riesman—for Dr. Yaskin remained a complete physician until the day of his death. His interns and residents worshipped him and called him 'Uncle Joe'; his colleagues respected and loved him. He was one of the last of an ending era in medicine, possibly never to be recalled—an era of sound clinical study and observation combined with an intimate appreciation of the patient, and a recognition of the studies pertinent to the problem with which he was concerned. Like all good clinicians his investigation of patients had intelligent direction. There were never studies merely for the purpose of covering the ground. He was one of a gifted few who usually had the right answer, but he was humble enough to know that nobody could always be right. If I were asked what I admired most in him, I would say that over and above his brilliance as a clinician was his readiness to sacrifice his comfort and even his health in the care of the sick. What more could be said of any physician? If the colleagues who sought his advice and help miss him for his skill, their loss is as nothing to those of us who knew him in all his glory and who miss him for his counsel and friendship. A bright star has fallen. We can only hope that its resplendence will continue to shine and inspire those who were fortunate enough to live in its light.

Memoir of Nathaniel W. Winkelman (1891-1956)*

By MATTHEW T. MOORE, M.D.

THE untimely death of Nathaniel W. Winkelman on February 13, 1956, at the age of 64, has saddened all those who knew him and has left a real breach in Philadelphia neuropsychiatry.

Nathaniel William Winkelman was born in the Kensington section of Philadelphia, October 28, 1891. He graduated from Central High School at the peak of his class, then entered the University of Pennsylvania where he completed his studies through college and Medical School, again with honors, in 1914. The inspiring stimulus of William G. Spiller in neurology during his final years in medical school, followed by the early training in neuropathology under Samuel T. Orton immediately after graduation, crystallized his unceasing interest and dedication to these demanding medical disciplines. Thus, after serving his internship at the Allegheny General Hospital 1914–15, he became resident in neuropsychiatry at the Pittsburgh City Hospital from 1915 to 1918. World War I brought no interruption to his chosen training for, as Neurologist of the U. S. Army Medical Corps to base hospital #87 at Toule, France, 1918–19, he acquired a rich experience in traumatic lesions of the nervous system, and emerged with the rank of Captain.

His role as an educator, which was an innate, ever-present, though unobtrusive quality, began immediately after his discharge from active service when in 1919 he became instructor in neurology at the University of Pennsylvania Medical School and advanced rapidly through the various positions to assistant professor of neurology in 1929. Busy 1920 marked his establishing the Department of Neuropathology at the Philadelphia General Hospital, where he served as Director until 1935. In 1920 also, as instructor in neuropathology of the Graduate School of Medicine, under Dr. Theodore Weisenberg, he laid the foundations for the ensuing fruitful years of teaching, investigation, and creative publications in neuropathology. His zeal and intense application were rewarded by frequent advancements so that by 1928 he was appointed professor of Neuropathology in the Graduate School of Medicine, University of Pennsylvania, which position, later augmented by Chairman of the department, he held until his death. 1920 saw the first publications of Dr. Winkelman, two in number, "An unsuual case of occlusion of the posterior inferior cerebellar artery," and "Two cases of median nerve injury," both of which appeared in the Archives of Neurology and Psychiatry. During the nineteen twenties the seat of neuropathological learning was Germany, and recognizing the need for broader training and experience Dr. Winkelman, with his wife, the former Lillie Gabel, whom he married September 16, 1919, and his two children, N. William, now a worthy successor to his father in neuropsychiatry, and Alean G., in 1925 embarked for Hamburg, Germany. Here in the laboratory of Alfons Jakob he spent the major part of his time in neuropathology. While in Germany he also studied neuropathology with Walther Spielmeyer, and clinical neurology with Max Nonne.

Temple University School of Medicine claimed him in 1929 as professor and head of the Department of Neurology. During the seven years he held this post he developed it into a colorful and stimulating department. Shortly after leaving Temple University Medical School in 1936 his psychiatric interest, which had its inception as a resident in neuro-

* Prepared and published at the request of the Council of the College of Physicians of Philadelphia.

psychiatry and its development under the tutelage of Dr. Weygandt in Europe, began to reflect the need for a psychiatric hospital in Philadelphia which would more adequately meet the requirements of advanced psychiatric thinking and treatment for the mentally ill. With great energy and the crepitation of life which characterized his activities, he set about indoctrinating individuals and groups interested in the problems of mental health as to the necessity and desirability of establishing such a hospital. So, with the coordinated and whole-hearted effort of a band of men and women, many of whom are still associated with the present hospital as its founding officers or emeritus officers, the Horace Berk Memorial Hospital came into being in 1937 and subsequently, in 1940, became the now-thriving Philadelphia Psychiatric Hospital. He was medical director of the hospital from 1937 to 1953 when he then was appointed vice-president in charge of medical affairs.

Dr. Winkelman held numerous medical appointments as testimony to his ability and unremitting labor. At his death, in addition to the positions already mentioned he held those of Professor of clinical psychiatry, Hahnemann Medical College and Hospital; Senior attending neurologist, Albert Einstein Medical Center; Consultant psychiatrist, Home for the Jewish Aged; Consultant neurologist: Norristown State Hospital, Pennsylvania; St. Joseph's Hospital, Reading, Pennsylvania; Scranton State Hospital, Pennsylvania. He served on the editorial boards of the Journal of Syphilis and Neurology, 1933–38, and the Journal of Neuropathology and Experimental Neurology 1949–55. He was a diplomate of the American Board of Neurology and Psychiatry, 1938, and was a member and fellow of local and national medical societies which included, among many others, the American Neurological Association (2nd Vice-President 1944–45); American Association of Neuropathologists (Past President), American Academy of Neurology; American Psychiatric Association; Association for Research in Nervous and Mental Diseases; A.M.A.; New York Academy of Sciences; Pennsylvania Psychiatric Society; Philadelphia Psychiatric Society; Philadelphia Neurological Society (Past President); Philadelphia Pathological Society; Philadelphia College of Physicians; Sigma Xi; and held an honorary membership in the Medical and Surgical Society of Athens, Greece. In 1952 he was appointed as American representative to the International Committee for the Study of the Psychoses.

His publications numbered over 100, the majority of which were on neuropathological or clinicopathological topics, while the remainder dealt with psychiatry and the neuropathology of psychiatric disorders. The subject matter was wide-ranging, but quite early he evinced keen interest in the small vessels of the brain and published several articles frequently quoted in the medical literature, the first of which, "Productive endarteritis of the small cortical vessels in severe toxemias," (with J. L. Eckel, Brain, 1927), aroused much attention. In 1932 he described the disorder, "Progressive pallidal degeneration," (Archives of Neurology and Psychiatry), which now bears the eponym "Winkelman's disease." His last published article, "Post-operative seeding of the subarachnoid space and ventricles from a meningioma," appeared in the Journal of Neuropathology and Experimental Neurology, January 1954.

Dr. Winkelman's life was not a steady progression of accomplishment and success untouched and unmarred by the searing flame of conflict and the felling blow of tragedy. The Cocoanut Grove holocaust in Boston, November 1942, took from him and his wife their daughter Alean, a beautiful and brilliant girl of eighteen who was just on the threshold of her college career. This crushing event colored his thought and behavior for the rest of his life, but this was apparent only to those who knew him well. Always devoted to his patients, he became more deeply interested in their medical problems and in their personal welfare, showing a tenderness that often was

reciprocated by them in acts of fervid affection and gratitude. This facet of his personality was hidden from the view of most of his colleagues and associates in his various endeavors. To them at times, although for the most part possessed of a lively sense of humor, some of the sad bitterness of Alean's loss was spent in an excessive attention to his profession which, during the last years of his life when his final illness was making its inexorable progress, created the impression of an aura of preoccupation. To the Philadelphia Psychiatric Hospital in particular his passing meant not merely the loss of a physician who had achieved eminence in the fields of neuropathology, clinical neurology and psychiatry, but the loss of one whose aspirations, labors, counsel and support are inextricably woven into the total fabric of the hospital and that for which it stands. The years of teaching, dreaming, working, for what now is the Philadelphia Psychiatric Hospital and what it is yet to be, the legions of students who were influenced and shaped by him, and the hosts of patients who felt his healing ministrations, gave to Dr. Winkelman the deep, inner satisfactions of creative living which weld the glory and reward as one.

Memoir of Charles Walter Bonney (1874-1956)*

By J. PARSONS SCHAEFFER, M.D.

DOCTOR CHARLES WALTER BONNEY, a son of New England, was born in Maine on February 24, 1874, died in Philadelphia, July 21, 1956. He had suffered a fracture of the hip, the result of a fall some months before his death, which with other contributing factors incapacitated him and ultimately led to his passing from us. Dr. Bonney was elected a Fellow of the College of Physicians of Philadelphia in 1911 and was active in the furtherance of the purposes and aims of the College until his fatal illness. He always regarded his election to Fellowship in the College as a step forward and as a great honor. Almost continuously from the time of his graduation from the Jefferson Medical College until his death, he was connected with the teaching staff of his *alma mater* in various capacities and responsibilities.

Dr. Bonney received his A.B. degree from Dartmouth College in 1899, and the M.D. degree from the Jefferson Medical College in 1904. He was an outstanding medical student and was elected a member of Alpha Omega Alpha, Honor Medical Society. On graduation he was awarded the H. M. Phillips prize in Medicine. After graduation he sought training in special fields and always took his teaching assignments seriously. He was a good teacher, and as a man, physician, and adviser gained the attention and respect of those with whom he came in contact.

Although Dr. Bonney was of the faith that no special branch of medicine was self-contained or self-sufficient, his primary interests and applications were in the field of surgery, primarily in urology. He was also interested in the methods of presentation of applied anatomy and its correlation and integration with clinical work. In this, he was a believer in constantly correlating the anatomy of the cadaver with that of the living body.

Dr. Bonney made substantial contributions to the literature in the field of Genito-Urinary Diseases and the surgery pertinent thereto. He also helped to further the cause of Living and Applied Anatomy, including the Sectional Method. During his early years in medicine he gave considerable time to abstracting and reviewing scientific papers and publications of a medical nature for publication in certain American medical journals. He was not only able to take on this work for English publications, but because of his knowledge of French, German, Portuguese and Italian, he included foreign articles and books as well.

Dr. Bonney was a member of the Philadelphia County Medical Society, the Pennsylvania State Medical Society, the American Medical Association, the American Urological Association, a Fellow of the American College of Surgery, and a Fellow of the College of Physicians of Philadelphia. At the time of his retirement from teaching, he was Assistant Professor of Topographic and Applied Anatomy at the Jefferson Medical College.

Dr. Bonney was always friendly and courteous and one who conducted himself as becomes a medical man; he enjoyed life, his work, his associates and friends. He will be missed by all who knew him.

* Prepared and published at the request of the Council of the College of Physicians of Philadelphia.

Memoir of Rufus Sargent Reeves (1882-1956)*

By MYER SOLIS-COHEN, M.D.

RUFUS SARGENT REEVES, son of Joseph M. and Josephine Lewry Reeves, was born in Philadelphia on August 1, 1882. His father was a physician.

From the University of Pennsylvania he received the degree of B.S. in 1906 and of M.D. in 1912. He was President of his college class from 1941 to 1946, and of his medical class from 1919 until his death. He also was President of the Organized Classes of the Alumni of the University of Pennsylvania in 1940–42, and of the Philadelphia Alumni Society of the Medical Department of the University in 1943–44.

Dr. Reeves interned at the Robert Packer Hospital in Sayre, Pennsylvania, and shortly thereafter became Prosector to the Professor of Anatomy and also Instructor in Medicine at his *alma mater*. Subsequently he was Associate in Medicine at the Methodist Episcopal Hospital and Physician to the Woman's Department at Moyamensing Prison in Philadelphia.

He specialized in internal medicine and was certified in 1939. He was Clinician to the Division of Cancer Control of the State Department of Health, Lecturer on Public Health and Preventive Medicine in the Medical School of the University of Pennsylvania, and Lecturer in its Institute of Local and State Government. Also he was Lecturer on Public Health in the Graduate Education Program of the Pennsylvania State Medical Society. He was the author of numerous medical papers, contributed to the *Cyclopedia of Medicine*, and was Associate Editor of *Modern Medicine*.

He became a Fellow of the College of Physicians of Philadelphia on May 11, 1925. He was President of the Philadelphia County Medical Society in 1939, and in 1936 founded its Postgraduate Institute, being its Director for eight years. He was a Fellow of the American College of Physicians and a member of other local, national and international medical societies, fraternal and social societies and clubs. He was Chairman of the Disaster Committee and of the Division on Medical Profession of the Southeastern Pennsylvania Chapter of the American Red Cross, and a member of many lay and medical Boards, Commissions and Committees.

In 1940 Dr. Reeves received the Strittmatter Award "for distinguished service redounding to the credit of the medical profession in the interest of humanity." The honorary degree of Doctor of Science was conferred on him by the Hahnemann Medical College in 1950. He also received numerous citations, certificates of merit and honorary memberships in lay and medical organizations.

During World War I, Dr. Reeves was a Lieutenant (Senior Grade) in the Medical Corps of the United States Naval Reserve and later served as Internist at the Receiving Ship in the Philadelphia Navy Yard. He was Contract Surgeon, United States Army, in World War II and Senior Medical Officer, United States Civil Service Commission, at the Philadelphia Signal Depot.

Dr. Reeves was the Director of Public Health of Philadelphia from 1944 to 1952. Upon assuming office he appointed thirty-two Medical Advisory Committees, covering all aspects of public health, which he consulted for advice when needed. He reorganized and enlarged the Divisions of Tuberculosis and Venereal Disease Control and created new Divisions of Health Center Administration,

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Air Pollution Control and Public Health Nursing. He made chest x-ray examination of food handlers compulsory, established chest x-ray stations and blood test centers, and conducted campaigns for free examinations in detection of tuberculosis, venereal disease and diabetes. He formulated regulations for hospital maternities and nurseries to prevent and control diarrhea in the newborn, and made reportable in Philadelphia, cancer, diabetes, rheumatic heart disease, tonsillitis and acute infectious hepatitis. During an epidemic of this last disease in South Philadelphia, he investigated all pupils in the area who were or had been absent from school. Dr. Reeves developed a program for a Consolidated Health Center in each health district of 200,000 population, located, when possible, near a medical school and convenient transportation facilities. He established seven new District Health Centers in Philadelphia where they could best serve community needs.

At the Philadelphia General Hospital, he succeeded in reorganizing the medical and surgical staff on a democratic from an autocratic basis and also invested greater power in the Superintendent. He enlarged the operative facilities and had built a new Neurological Building, a new large and well-equipped Kitchen, and a new immense Dining Hall. He also established there a Rapid Treatment Center for Venereal Disease and a Rheumatic Fever Program for complete study of underprivileged patients of private physicians.

He began the conversion of the Philadelphia Hospital for Contagious Diseases into the Northern Division of the Philadelphia general Hospital and carried on a building program there.

On June 7, 1917, Dr. Reeves married Edith Clayton Godshall. They had a daughter, Edith Mary, who became Mrs. J Guy Himmelberger. Dr. Reeves and his wife were subsequently divorced and on March 4, 1950, Dr. Reeves married Emma Weber, who survives him.

Dr. Reeves attained his often-expressed desire "to die with his boots on," having prescribed for patients and made plans for the future only two days before his death on July 13, 1956.

Transactions of the Sections

SECTION ON GENERAL MEDICINE

22 October 1956

An Outbreak of Botulism: Report of One Fatal and One Recovered Case. John Lansbury, M.D., and Fred B. Rogers, M.D. (Discusser: Alexander Witkow, M.D., M.P.H.) (*Abstract* 1, below)

The Clinical Applications of the Fractionation of Serum Proteins by Paper Electrophoresis. F. William Sunderman, M.D., and F. William Sunderman, Jr.*, M.D. (Discusser: J. W. Savacool, M.D.) (*Abstract* 2, below)

Mediterranean Trait in Negro Family. Harry Schecter*, M.D., and Abraham M. Frumin*, M.D. (Discusser: Irving Waldow, M.D.) (*Abstract* 3, below)

A Consideration of the Broad Spectrum Applications of Heparin in Various Clinical Entities. Karl L. Roth*, M.D. (Discusser: Abraham M. Frumin, M.D.) (*Abstract* 4, below)

26 November 1956

Thrombosis of Abdominal Aorta (Leriche Syndrome) Resulting from Trauma. Meyer Naide, M.D. (Discusser: John Y. Templeton, III, M.D.) (*Abstract* 5, below)

The Production of Tetanus Antitoxin by Patients with Hepatic Cirrhosis. W. Paul Havens, Jr., M.D., Ralph M. Myerson*, M.D., and Jean Klatchko*, M.A. (Discusser: Joseph Stokes, Jr., M.D.) (*Abstract* 6, below)

The Clinical Management of Idiopathic Hirsutism. William H. Perloff, M.D. (Discusser: Bertram J. Channick, M.D.) (*Abstract* 7, below)

Unusual Clinical and Diagnostic Features of Pulmonary Embolism. Franz Goldstein*, M.D., and Harold L. Israel, M.D. (Discusser: Francis C. Wood, M.D.) (*Abstract* 8, below)

* By invitation.

28 January 1957

Thrombotic Thrombocytopenic Purpura. Herbert W. Lohmuller*, M.D. (Discusser: Leandro M. Tocantins, M.D.) (*Abstract* 9, below)

Evaluation of Hormonal Dependence in Metastatic Breast Carcinoma. Arthur Steinberg*, M.D. (Discusser: Charles Fineberg, M.D.) (*Abstract* 10, below)

Hemoptysis of Unusual Etiology. Stanley J. Skromak, M.D., and Charles J. Schreader, M.D. (Discusser: Harold L. Israel, M.D.) (*Abstract* 11, below)

The Use of Radioisotopic Techniques in the Functional and Anatomic Diagnosis of Cardiovascular Abnormalities. Hadley L. Conn*, Jr., M.D., and Donald F. Heiman*, M.D. (Discusser: Calvin F. Kay, M.D.) (*Abstract* 12, below)

SECTION ON MEDICAL HISTORY

9 October 1956

Symposium on Faith and Healing: Origins of Psychosomatic Medicine.

Faith and Healing[1]. Rev. Ernest Gordon*.

St. Luke the Evangelist—A Psychosomatic Prophet[1]: Nicholas Padis, M.D.

The Origins of Psychosomatic Medicine[1]. Edward Weiss, M.D.

The Need to Believe[1]. Kenneth E. Appel, M.D.

4 December 1956

John and William Hunter and Some Eighteenth Century Scientific Moods. Jane M. Oppenheimer*, Ph.D.

John Hunter and the Significance of His Neurological Research. George M. Austin, M.D.

William Hunter's Observations on Arterio-Venous Aneurysms. J. Richard R. Bobb*, M.D.

[1] Published in *Transactions & Studies*, February, 1957.

SECTION ON OPHTHALMOLOGY[2]

25 October 1956

Carcinoma of the Lacrimal Sac. Edmund B. Spaeth, M.D.

The Use of Thorazine (Chlorpromazine) in 200 Consecutive Cataract Extractions. R. D. Harley*, M.D., and J. E. Mishler*, M.D.

Report on a New Carbonic Anhydrase Inhibitor. Bernard Gettes*, M.D., and Marvin M. Balistocky*, M.D.

15 November 1956

Central Serous Choroidosis Associated with Amebiasis. Alson E. Braley*, M.D. (Nineteenth Annual de Schweinitz Lecture)

13 December 1956

(Joint Meeting with Eye Section, Philadelphia County Medical Society)

Pathogenesis of Papilledema. Thomas R. Hedges, Jr.*, M.D.

Biomicroscopy of the Vitreous. Professor Hans Goldmann*, Bern, Switzerland.

SECTION ON OTOLARYNGOLOGY[3]

21 November 1956

(Joint Meeting with the Philadelphia Laryngological Society)

Surgery in Laryngeal Cancer. John J O'Keefe, M.D.

The Problem of Facial Nerve Paralysis in Disease of the Temporal Bone. David Myers, M.D., and Woodrow D. Schlosser*, M.D.

SECTION ON PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE

31 October 1956

Panel Discussion: Ambulatory Management of Mental Illness.

Moderator: John E. Davis*, M.D.

Out-Patient Treatment. Edward T. Auer*, M.D.

Vocational Rehabilitation. M. J. Reisman*.

Community Services. Maurice E. Linden*, M.D.

[2] Abstracts of the presentations at this Section customarily appear in the *American Journal of Ophthalmology* and the *A. M. A. Archives of Ophthalmology*.

[3] Abstracts of the presentations at this Section customarily appear in the *A. M. A. Archives of Otolaryngology*.

ABSTRACTS

Abstract 1

An Outbreak of Botulism: Report of One Fatal and One Recovered Case. John Lansbury, M.D., and Fred B. Rogers, M.D.

An outbreak of botulism is reported involving 3 men who ate improperly prepared, marinated mushrooms contaminated with *Clostridium botulinum*. According to the relative amounts of this food ingested, there resulted one fatal poisoning, one case with serious nervous system involvement, and another with gastro-intestinal upset. These patients, the only reported cases of botulism in Philadelphia during the past 26 years, stress the importance of early and accurate diagnosis, prompt specific treatment, and the need for continuing efforts to prevent the occurrence of this dangerous type of food poisoning.

A case of botulism with recovery is described in a 35 year old white Italian man who was admitted to Temple University Hospital on April 12, 1955. Clinical features included gradual onset of dysphagia and dry mouth, headache, diplopia, muscle weakness with reduced reflexes, intestinal hypoperistalsis with obstipation, and absence of fever or sensory disturbances. Use of therapeutic botulinus antitoxin was complicated by the occurrence of serum sickness. Treatment of this complication involved the first use of steroid hormones (ACTH, hydrocortisone, prednisone) to ameliorate the manifestations of botulism. Convalescence was prolonged; a diurnal pattern of afternoon fatigue, constipation and persistent muscular weakness continued for six months after the patient left the hospital on May 7, 1955. Prostigmine, useful in myasthenia gravis, was unavailing in this patient.

The second man became violently ill several hours after eating the contaminated mushrooms and died of respiratory and cardiac arrest at Methodist Hospital, Philadelphia, on the following day. The third man ate little of the mushrooms and when contacted by city health department officials, reported only minor gastro-intestinal upset.

The present small outbreak presented problems for the attending physicians and public health authorities, and cited the fact that botulism, though fortunately rare today, must be suspected in order to be diagnosed early enough to institute specific therapy.

In botulism the clinical picture resembles that of atropine overdosage, in contrast to the symptoms of mushroom poisoning which resemble those produced by pilocarpine. Botulinus toxin is one of the most potent poisons known, its action being the inhibition of acetylcholine at the myoneural junction and parasympathetic end organ paralysis. Clinical and laboratory features of botulism were briefly reviewed to emphasize the necessity of early diagnosis, prompt treatment, and future prevention of this unusual but serious disorder.

Abstract 2

THE CLINICAL APPLICATION OF THE FRACTIONATION OF SERUM PROTEINS BY PAPER ELECTROPHORESIS. F. William Sunderman, M.D., and F. William Sunderman, Jr., M.D.

Analyses of serum proteins by paper electrophoresis have been made by us upon more than 1000 serums from patients suffering from a wide variety of pathologic conditions. The clinical records of these patients were surveyed, and in 183 cases the diagnosis appeared to be clear-cut and uncomplicated. The clinical records of these 183 patients were grouped into 21 disease categories. Statistical comparisons were made of the means of the electrophoretic fractionations for each of the categories with the means from a group of normal blood donors.

The following changes were observed in the various categories:

Hepatic Cirrhosis—decreased concentrations of total protein and albumin with elevation of gamma globulin.

Viral Hepatitis—decreased concentration of alpha-1 globulin, and a tendency toward elevation of gamma globulin. In contrast to hepatic cirrhosis, the mean total protein and albumin concentrations were normal.

Nephrosis—increased concentration of alpha-2 globulin and decreased concentration of all the other globulin fractions and of albumin. In two cases the concentration of gamma globulin was decreased to levels obtained in hypogammaglobulinemia.

Scleroderma—tendency toward diminution of all moieties, such as might be observed with simple dilution.

Lupus Erythematosus—decreased concentration of albumin and increased concentration of gamma globulin.

Rheumatoid Arthritis—decreased concentration of albumin and increased concentrations of alpha-2 and gamma globulins.

Boeck's Sarcoid—increased concentration of total protein; diminished concentration of albumin and steplike increases in concentrations of alpha-2, beta and gamma globulin ("sarcoid steps").

Multiple Myeloma—decreased concentration of albumin and increased concentration of the total globulins. The mobility of the abnormal "m" globulin may vary from that of alpha-2 to post-gamma ("slow gamma") globulin.

Lymphocytic Leukemia and Lymphomas—decreased concentrations of total protein and albumin, and a marked diminution of gamma globulin.

Myelogenous and Monocytic Leukemias—decreased concentration of albumin and, in contrast to lymphocytic leukemia, increased concentration of gamma globulin.

Hodgkin's Disease—decreased concentrations of total protein, albumin and alpha-1 globulin; increased concentrations of alpha-2 and gamma globulins.

Hypogammaglobulinemia—minimal concentration of gamma globulin and normal levels of all of the other fractions.

In *Metastatic Carcinomatosis*, *Glomerulonephritis*, *Pyelonephritis*, *Diabetes Mellitus*, *Rheumatic Fever*, *Acute and Chronic Infections*, *Congestive Heart Failure*, and *Psoriasis*, the changes in the electrophoretic patterns are considered to be non-specific. In general, the changes consist of diminished concentrations of serum albumin and increased concentrations of alpha-2 globulin.

Abstract 3

MEDITERRANEAN TRAIT IN A NORTH AMERICAN NEGRO FAMILY. Harry Schecter, M.D. and Abraham M. Frumin, M.D.

A negro female, one of ten siblings born in Alabama, was found to have Mediterranean trait during the course of a routine pre-natal hematological investigation. Study of her own three children revealed a similar microcytic, hypochromic anemia and reticulocytosis, also ascribed to Mediterranean trait. Peripheral blood smears showed the presence of orthochromatic target cells, ovalocytes, and basophilic stippling of erythrocytes. Further hematological investigation revealed normal serum bilirubin and serum iron values. A reduced radioactive Chromium (Cr 51) erythrocyte survival time was found. Paper electrophoresis and alkali denaturation of hemoglobin revealed no abnormalities. Studies of similar reported cases were presented and errors in the diagnosis of this disease emphasized.

Abstract 4

A CONSIDERATION OF THE BROAD SPECTRUM APPLICATIONS OF HEPARIN IN VARIOUS CLINICAL ENTITIES. Karl L. Roth, M.D.

The use of heparin, as suggested in this presentation, will not be concerned with its anticoagulant, antifibrinolytic, or lipemia-clearing activities, but rather with little known and poorly understood pharmacological effects. Even its role as a vasodilator, beneficial not only in "organic" but also in "functional" vascular disorders (Raynaud's disease), will be neglected in favor of evidence showing the direct participation of heparin in immuno-hematological dyscrasias.

Reference will be made to the protective action of heparin in cases of paroxysmal nocturnal hemoglobinuria, acquired hemolytic anemia, and in general, to its beneficial activity in all syndromes involving immune or *non-immune* hemolysis.

It will be shown that the anticomplementary effect of heparin accounts but for a minor part of these characteristics, and that a direct interrelationship exists between whatever is responsible for auto-immune phenomena and (in vivo) heparin. Experiments performed in vivo will illustrate the usefulness of heparin as an adjunct in the initial treatment of acquired hemolytic anemia, until such time as results with steroid therapy (5–7 days) will become effective.

Special emphasis will be placed on the problem of dosage of heparin, since the speaker believes that they are generally much too high, even in cases where achievement of a "simple" anticoagulant effect is the sole reason for administration.

An attempt will be made to show that in cases involving *true* competitive inhibitors (like heparin), besides the usual damage caused by an overdose, we may be faced with another damage resulting from minute amounts of the substance, i.e.: an enhancement of the very activity we were attempting to inhibit!

Abstract 5

THROMBOSIS OF ABDOMINAL AORTA (LERICHE SYNDROME) RESULTING FROM TRAUMA. Meyer Naide, M.D.

The Leriche syndrome or ascending thrombosis of the abdominal aorta was first described in 1940. Since then there have been numerous reports of thrombosis of the terminal aorta, particularly since it has become possible to substitute a vascular graft for the thrombosed segment. Atherosclerosis is said to be the cause of this condition. There are a number of

puzzling facts which lead one to believe that atherosclerosis in some and perhaps in many of these patients, is secondary rather than the true cause of the syndrome. One of the difficulties in explaining this syndrome only on the basis of atherosclerosis is that these patients rarely show atherosclerosis in arteries other than in the aorta. Furthermore, these patients are rarely diabetic and have only occasional histories of associated cardiac disease or hypertension. Several patients seen gave a history of trauma as a probable precipitating cause of the aortic thrombosis. One patient gave a history of having been run over by an automobile across his abdomen many years previously. It is pointed out that the abdominal aorta is anatomically susceptible to severe trauma which may result in injury at the site of which atherosclerosis may subsequently develop. This is a probable cause of the Leriche syndrome in at least a certain proportion of these patients.

Abstract 6

THE PRODUCTION OF TETANUS ANTITOXIN BY PATIENTS WITH HEPATIC CIRRHOSIS. W. Paul Havens, Jr., M.D., Ralph M. Myerson, M.D., and Jean Klatchko, M.A.

Patients with acute viral hepatitis produce considerably more gamma globulin than patients with most other viral infections. In the small percentile of patients who develop chronic hepatitis, this excessive production of gamma globulin persists, and the questions have been raised (1) whether it represents an antibody to some antigenic product of hepatic necrosis, and (2) whether the production of such an antibody might represent a response peculiar to the individual and be operative in the continuance of hepatic disease. With these points in mind, earlier studies in our laboratory were carried out to determine the immunologic potential of patients with chronic hepatic disease, and it was demonstrated that, in general, they do have an enhanced capacity for the production of at least one antibody (diphtheria antitoxin).

The need for a human source of tetanus antitoxin, in order to avoid the sensitization of large numbers of persons each year to horse serum, prompted the investigation as to whether men with hepatic cirrhosis, hyperimmunized against tetanus, might be able to produce large enough amounts of antitoxin to make them good sources of this antibody. World War II veterans with hepatic cirrhosis were used in these studies because they had been completely immunized with tetanus toxoid ten to fifteen years previously. The amounts of circulating tetanus antitoxin were determined (by neutralization tests in mice) in twenty subjects who were subsequently inoculated with 0.5 ml. alum precipitated tetanus toxoid subcutaneously. Determinations of the amounts of circulating tetanus antitoxin were made at weekly intervals following inoculation for several weeks. Detectable increases in circulating antibody were present seven days after inoculation, reaching a peak usually at fourteen days, and then declining gradually over the ensuing few weeks. The average maximum measured amounts of antitoxin exceeded considerably those produced by similarly immunized World War II veterans without cirrhosis, described by others. Ten out of twenty of the subjects with hepatic cirrhosis produced 50 or more units of antitoxin/ml. serum; and of these, four produced in excess of 100 units/ml. serum. Since much less homologous antibody would doubtless be necessary to prevent tetanus in man, the production of such relatively large amounts of antitoxin by certain of these patients with hepatic cirrhosis would make them candidates for the production of human tetanus antitoxin in amounts practical for administration in man.

Of interest was the fact that in those patients with ascites, tetanus antitoxin appeared in the ascitic fluid, reaching equilibrium after a few days, although always at a lower level than found in the blood when simultaneous determinations were made.

Abstract 7

THE CLINICAL MANAGEMENT OF IDIOPATHIC HIRSUTISM. William H. Perloff, M.D.,

Harry E. Hadd, M.A., Bertram J. Channick, M.D., and John H. Nodine, M.D.

The total urinary neutral 17-ketosteroid excretion of female patients with so called "idiopathic hirsutism" was measured. Levels were usually in the top normal range or slightly elevated. Separation of the 17-ketosteroids with the $C_{19}O_2$ grouping (representing the metabolic breakdown-products of the biologically more potent androgens) from those with the $C_{19}O_3$ grouping (representing the end-products of the weak androgens) was performed. Patients with idiopathic hirsutism uniformly showed an elevation over normal of the $C_{19}O_2$ compounds, resembling in this regard the male excretory pattern. Treatment with small doses of prednisone resulted in a decrease in the total neutral 17-ketosteroids and particularly in the $C_{19}O_2$ fraction, changes which persisted after cessation of therapy. The hirsutism also responded favorably. It is, therefore, thought that idiopathic hirsutism is in reality a syndrome involving selective androgenic adrenocortical hyperplasia—a mild adrenogenital syndrome.

Abstract 8

Unusual Clinical and Diagnostic Features of Pulmonary Embolism. Franz Goldstein, M.D., and Harold L. Israel, M.D.

The most common disease of the lungs now encountered in general hospitals is pulmonary embolism. This diagnosis therefore deserves first consideration in patients with respiratory illnesses, and requires consideration as well in all patients with cardiovascular symptoms. Growing familiarity with the varied clinical syndromes that embolism can produce has led to the realization that the text-book picture is uncommonly encountered. Pulmonary embolism is often not recognized because so many physicians consider that certain radiologic and electrocardiographic changes are essential to the diagnosis.

Pulmonary embolism will continue to go unrecognized until is is more widely appreciated that emboli can produce symptoms, signs and radiologic changes characteristic of pneumonia, tuberculosis, neoplasm, pleurisy with effusion, lung abscess, and empyema. Similarly pulmonary embolism may be responsible for clinical and electrocardiographic changes indicative of myocardial infarction, coronary insufficiency, and chronic cor pulmonale with congestive failure. Patients with recent myocardial infarction may develop right-sided mural thrombi with repeated minor pulmonary embolic episodes easily mistaken for coronary activity.

The one most important point in arriving at the correct diagnosis of pulmonary embolism is the awareness and suspicion of embolism in the multitude of syndromes which it may produce. An informed evaluation of all available symptoms, signs and laboratory data will then usually permit the correct diagnosis. The common symptoms produced by pulmonary embolisms are pleuritic, or less commonly coronary-type, chest pains, dyspnea, tachycardia, tachypnea and marked perspiration. None of these need be present. Severe localized chest pain and tenderness is present in some patients. Sharply localized pulmonary rales and friction rubs are common but easily missed. Careful examination of both upper and lower extremities for evidence of thrombophlebitis is essential, but the signs of phlebitis may appear after the embolic episode. The fever of pulmonary embolism frequently does not respond to antibiotics. Radiograms of the chest are helpful, but (1) There is no specific x-ray picture of pulmonary embolism and the radiologist should not be expected to make the diagnosis, (2) The x-ray shadow of pulmonary infarction may not appear until 24 to 48 hours after the embolic episode, and (3) A negative radiogram does not rule out pulmonary embolism. The electrocardiogram may similarly remain negative, or may show a variety of non-specific findings, right bundle branch block, changes in electrical axis and position, or may simulate antero-septal or inferior wall myocardial infarction. The "typical" pattern of acute cor pulmonale is seen rarely.

Recently we have found the determination

of serum glutamic oxalacetic transminase levels to be helpful in the differential diagnosis of pulmonary embolism. The level of this enzyme in serum was found to be normal in uncomplicated pulmonary embolism and infarction. A normal serum transaminase level determined at the appropriate time tends to rule out myocardial infarction and an elevated level suggests the presence of such conditions as are known to produce transaminase elevations, particularly myocardial infarction, alone or concomitantly with pulmonary embolism. When subendocardial infarction follows massive pulmonary embolism, the elevation of serum transaminase has proved to be the most valuable diagnostic clue.

Abstract 9

THROMBOTIC THROMBOCYTOPENIC PURPURA. Herbert W. Lohmuller, M.D.

Thrombotic thrombocytopenic purpura is a rare disease of unknown cause. It is characterized clinically by a triad of thrombocytopenic purpura, hemolytic anemia and neurological signs. It was originally described by Moschowitz in 1925 and more clearly delineated by Baehr, *et al* in 1936. Approximately 70 cases have been reported.

Case 1: A 35 year old white male whose illness began three weeks prior to admission with hemorrhagic signs, fever, and weakness is reported. Physical examination revealed petechiae, hepatomegaly, splenomegaly and scleral icterus. Studies revealed an anemia with normal white blood cells and thrombocytopenia. There were peripheral nucleated red blood cells, an elevated BUN, a normal bone marrow examination, and an abnormal urinary sediment. ACTH, cortisone, and antibiotics were given, but increasing stupor, coma and death occurred rapidly within 48 hours of admission. Post mortem examination revealed the typical findings of TTP.

Case 2: A 34 year old white female had a history of petechiae intermittently over the last several years. Her illness began three days prior to admission with petechiae, transitory neurological signs and icterus. Studies revealed an anemia with leukocytosis, thrombocytopenia and nucleated red blood cells in the peripheral smear. An elevated BUN, abnormal urinary sediment, negative Coombs' test and non-specific electrocardiographic changes were found. ACTH, cortisone, antibiotics and blood transfusions were used with clinical improvement initially, but later, gradually increasing stupor, coma, and death five days after admission. A postmortem study was not obtained.

A brief discussion of the pathogenesis summarizes the present opinion of a primary vascular disease, which may be associated with other collagen diseases such as disseminated lupus erythematosus, and polyarteritis nodosa. The histologic pattern is one of occlusion of small blood vessels with an amorphous or granular acidophilic material which most resembles a button of human platelets. These thrombi are considered to be secondary to an endothelial change. Various prodromata occur with neurological signs, icterus, anemia, and death-usually within days or weeks of the onset. The treatment of the disease has generally been unsatisfactory.

Abstract 10

EVALUATION OF HORMONAL DEPENDENCE IN METASTATIC BREAST CARCINOMA. Arthur Steinberg, M.D.

For the past five years the problem of the management of metastatic breast carcinoma has been investigated at Albert Einstein Medical Center (Southern Division), Philadelphia. The primary purpose of this investigation has been aimed at attempting to define the hormonal-dependent types of breast carcinoma. If this hormonal dependence is established, then appropriate therapy could be carried out with confidence. With this in mind a battery of studies was designed to determine:

1. Hormonal dependence
2. Response to therapy
3. Progress of metastasis and its early detection
4. "Breakthrough" under treatment.

Gonadotrophins were determined to afford evidence of pituitary inhibition by steroids and

to demonstrate changes after castration and adrenalectomy.

17-ketosteroids revealed data on the utilization of steroids, particularly androgens, and served as a guide in dosage which must be sufficient to reverse the androgen/estrogen ratio. It was found that in some cases evidence occurred which seemed to indicate that the administered androgens were converted, at least in part, to estrogen. About one half the dose of administered testosterone is excreted as 17-ketosteroid, and cortisone produced a marked increase in excretion of 17-ketosteroid when compared to patients without cancer. This occurred despite the fact that a decrease was anticipated due to pituitary and adrenal cortical inhibition. Estrogens were determined in order to demonstrate residual ovarian activity or adrenal cortical elaboration of this substance. It has been found that this hormone may be present in significant amounts even in elderly individuals, or following x-ray irradiation to the ovaries.

A test has been devised to distinguish between estrogen elaborated by the ovary and that secreted by the adrenal cortex. This test is based on stimulating the ovaries with gonadotropic hormone derived from pregnant mare serum or sheep pituitary. If there is residual ovarian function, there will be an increased amount of estrogen following administration of these agents. If the source of estrogen is adrenal cortex, there will be no alterations in this excretion.

The alpha lipoproteins, particularly alpha-1, have been found to be decreased in metastatic breast carcinoma. After favorable therapeutic response, there is an increase in both the alpha and beta lipoproteins.

Studies on the glycoproteins in metastatic breast carcinoma reveals an increase in the presence of metastases and a decrease following following suppression of metastases by x-ray, steroids, castration and adrenalectomy.

The glycolytic enzymes in the serum have been investigated in metastatic breast carcinoma and found to be increased. The serum phosphohexose-isomerase typifies results obtained with these enzymes. With favorable therapy there is a prompt fall in the blood value of this enzyme. The source of the enzyme may be either the glycolytic activity of the tumor, destruction of contiguous tissue by invading cancer, or the systemic effect of the metastasis at a tissue level. Daily urinary calciums were determined in patients with a low fixed calcium intake. This measurement was found to be a sensitive guide to the presence of metastasis, even before there was radiologic evidence, and also for determining response to therapy.

The following plan is carried out routinely on all cases of metastatic breast carcinoma in order to establish the presence of hormone dependence and to serve as a provocative therapeutic test. The patient is placed on a low calcium diet consisting of 200 mg. of calcium a day. Daily 24 hour refrigerated urines are collected throughout the observation period. Fasting bloods are drawn at the completion of each therapeutic trial period. The following determinations are carried out on the urines:

1. Calcium
2. Gonadrotrophins
3. Estrogens
4. 17-ketosteroids
5. 17-hydroxycorticoids

The following determinations are carried out on the blood:

1. Calcium and phosphatase
2. Alpha lipoproteins and phosphatase
3. Acid phosphatase
4. Electrophoretic patterns
   a. proteins
   b. lipoproteins
   c. glycoproteins
5. Serum phosphatase glycoproteins
6. Total lipids
7. Non-protein nitrogen
8. Plasma 17-hydrocorticoids

This information obtained from the battery of studies serves a baseline to compare therapeutic response in this provocative test.

After a five day period of baseline studies,

the following agents are administered at appropriate intervals:

1. Gonadogen
2. Prednisone
3. Diethylstilbesterol
4. Halotestin
5. Testosterone

At the conclusion of the test period, information as to the hormonal dependence of the tumor and the appropriate therapy indicated is afforded. To date almost one hundred cases have been studied in this manner. Preparation of this data is now in progress.

Abstract 11

HEMOPTYSIS OF UNUSUAL ETIOLOGY. Stanley J. Skromak, M.D., and Charles J. Schreader, M.D.

Congenital absence of a pulmonary artery may be the cause of hemoptysis in certain patients. A case of this anomaly seen in a 23 year old white woman is presented. The clinical picture, together with the diagnostic roentgen and angiocardiographic evidence, is displayed and discussed.

The presented case, the seventeenth such case published, first had hemoptysis at the age of 6 years. Her next episode was seventeen years later, at which time angiocardiographic study made a definitive diagnosis.

The altered circulation of the affected lung was by way of the bronchial arteries and this fact, with the associated pressure changes in the pulmonary vasculature, was regarded as the cause of the hemoptysis.

Features of this case and other published cases were summarized and the hazards of bleeding from the affected lung or infection in the unaffected lung were discussed.

Abstract 12

THE USE OF RADIOISOTOPIC TECHNIQUES IN THE FUNCTIONAL AND ANATOMICAL DIAGNOSIS OF CARDIOVASCULAR ABNORMALITIES. Hadley L. Conn, Jr., M.D., and Donald F. Heiman, M.D.

The Stewart dilution principle, using dyes as indicators, has been employed for many years for the measurement of cardiac output, 'central' blood volume and circulation times, both in experimental and in clinical studies. Recent advances in catheterization techniques and the use of radioisotopes as indicators have permitted much more widespread application of this principle in the study of cardiovascular problems. Chromium^{51} for labelling the red cells, and I^{131} albumin, K^{42}, or Na^{24} for labelling the plasma have been the main tracer substances used. These materials are injected into peripheral veins, into the chambers of the right heart during venous catheterization, or into the chambers of the left heart following percutaneous needle puncture of the left atrium. Measurement of subsequent radioactivity in blood is carried out, using scintillation or Geiger counters with appropriate counting rate meters and recorders, by sampling and counting blood drawn from a vessel or by counting externally over an appropriate part of the cardiovascular system.

These techniques have been applied to such problems as congenital heart disease, rheumatic heart disease, and arteriosclerotic coronary artery disease. They are used to define the presence, location, direction, and the approximate size of intracardiac shunts such as occur with atrial and ventricular septal defects. They are used to determine the presence and the degree of valvular stenosis and/or insufficiency present in rheumatic heart disease. With simultaneously measured heart chamber pressures and the application of hydraulic formulae, the surgeon can be supplied with predicted valve orifice measurements. Still another illustration of the use of these techniques is in the evaluation of coronary artery disease. In this situation a relatively simple method for determining coronary blood flow is applied. The degree of fall from normal values has seemed well correlated with the degree of coronary artery disease.

List of College Lectures, 1956

4 January 1956

Harris, Isbell. Trends in Research on Opiate Addiction. (Nathan Lewis Hatfield Lecture XL; *Transactions & Studies*, June, 1956)

1 February 1956

Penfield, Wilder. The Aegean Cradle of Medicine. (S. Weir Mitchell Oration XIV; *Transactions & Studies*, June, 1956)

7 March 1956

Scott, William Wallace. Diseases of the Prostate Gland. (Benjamin Musser Lectureship on Clinical Medicine VI; *Transactions & Studies*, June, 1956)

4 April 1956

Varco, Richard Lynn. Direct Vision Intracardiac Surgery: Techniques, Problems, and Accomplishments. (Mary Scott Newbold Lecture LXXII; *Transactions & Studies*, August, 1956)

23 May 1956

Joint Meeting, Philadelphia County Medical Society and College of Physicians of Philadelphia. Presentation of 33rd Annual Strittmatter Award of the Philadelphia County Medical Society to Dr. Louis H. Clerf by Dr. Lewis C. Scheffey, Chairman of Award Committee.

3 October 1956

Greene, Harry S. N. The Significance of Transplantability. (Thomas Dent Mütter Lecture LXIX; *Transactions & Studies*, February, 1957)

7 November 1956

Groover, Marshall E., Jr. Clinical Evaluation of a Public Health Program to Prevent Coronary Artery Disease. (Mary Scott Newbold Lecture LXXIII; *Transactions & Studies*, February, 1957)

5 December 1956

Hertig, Arthur T. Pathogenesis of Uterine Cancer; Cervical and Endometrial. (Mary Scott Newbold Lecture LXXIV; *Transactions & Studies*, June, 1957)

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To serve until January 1959
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To serve until January, 1960
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Francis C. Wood

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Francis C. Grant
Hubert A. Royster

Weir Mitchell Oration

Bernard J. Alpers, ch'n
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Thomas E. Machella, vice ch'n & sec.
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1952. Abelson, Neva Martin, 32 Woodale Rd.
1926. Adler, Francis Heed, 313 S. 17th St.
1949. Aegerter, Ernest E., 3400 N. Broad St. (40)
1953. Agerty, Horst A., 1111 N. 63rd St. (31)
1936. Alexander, Fay Knight, Germantown Professional Bldg., Greene and Coulter Sts.
1932. Allen, Frederick H., 3915 Henry Ave. (29)
1953. Allman, David B., 104 St. Charles Pl., Atlantic City, N. J.
1935. Alpers, Bernard J., 111 North 49th St.
1930. Appel, Kenneth E., 111 N. 49th St.
1905. Appleman, Leighton Francis, 308 S. 16th St.
1935. Armitage, George L., 400 E. 13th St., Chester, Pa.
1922. Arnett, John H., 2116 Pine St.
1942. Aronson, Joseph D., Henry Phipps Institute, 7th and Lombard Sts.
1952. Ash, Rachel, 5636 Pine St. (43)
1952. Aston, Melville J., 2507 S. 21st St.
1944. Atkins, Joseph P., 1201 Knox Rd., Wynnewood, Pa.
1956. Atkinson, John B., Chestnut & Copley Rds., Upper Darby, Pa.
1935. Atlee, John L., Jr., 37 E. Orange St., Lancaster, Pa.
1952. Atlee, William A., 37 E. Orange St., Lancaster, Pa.
1954. Austin, George M., 3400 Spruce St. (4)
1935. Bach, Theodore F., 1900 Rittenhouse Sq.
1942. Bachman, Carl, Univ. of Pa. Hospital (4)
1937. Bacon, Emily P., Lankenau Medical Bldg., (31)
1952. Baier, Howard N., 3401 N. Broad St.
1952. Baker, Howard W., 3401 N. Broad St.
1946. Baker, Walter W., 255 S. 17th St.
1957. Baltzell, William Hewson, 1530 Locust St. (2)
1940. Barba, Philip S., 5919 Greene St.
1943. Barden, Robert P., 8835 Germantown Ave.
1911. Barnard, Everett P., 1820 Rittenhouse Sq.
1939. Barnshaw, Harold D., 406 Cooper St., Camden, N. J.
1939. Bartle, Harvey, Jr., 133 S. 36th St.
1931. Bates, William, 2029 Pine St.
1932. Batson, Oscar V., 3502 Hamilton St.
1921. Bauer, Edward L., 5501 Greene St. (44)
1933. Bauer, John T., 312 E. Second St., Moorestown, N. J.
1939. Baumann, Frieda, 3300 Henry Ave. (29)
1930. Beardwood, Joseph T., Jr., 2031 Locust St.
1955. Beckfield, William J., Phila. General Hospital, 34th & Curie Ave. (4)
1952. Bedrossian, E. Howard, 2027 Spruce St.
1949. Beecham, Clayton T., 155 W. Walnut Lane, (44)
1935. Beerman, Herman, 255 S. 17th St. (3)
1942. Behrend, Albert, 255 S. 17th St.
1945. Behrend, Bernard, 5910 Greene St.
1934. Behrend, Moses, 255 S. 17th St.
1949. Beizer, Lawrence H., 304 S. 19th St. (3)
1930. Belk, William Parks, 433 Owen Rd., Wynnewood, Pa.

1936. Bell, Benjamin Tertius, Abington Medical Bldg., Keith & York Rds., Abington, Pa.
1956. Beller, Martin Leonard, 1936 Spruce St. (3)
1947. Bellet, Samuel, 2021 Spruce St.
1954. Bello, Carmen T., 3401 N. Broad St. (40)
1956. Belmont, Owen, 2731 N. 5th St. (33)
1952. Bennett, George A., 1025 Walnut St.
1941. Bernstein, Mitchell, 7609 Mountain Ave. (17)
1951. Bernstine, J. Bernard, 255 S. 17th St.
1956. Berry, Theodore J., 331 E. Lancaster Ave., Wynnewood, Pa.
1918. Billings, Arthur E., 2020 Spruce St.
1952. Bird, Gustavus C., Jr., 3401 N. Broad St. (40)
1949. Bishop, Edward H., 811 Spruce St. (7)
1933. Bishop, Paul A., Pennsylvania Hospital.
1944. Blady, John V., Parkway House, 2201 Benjamin Franklin Pkwy. (30)
1952. Blake, Paul O., 273 N. Lansdowne Ave., Lansdowne, Pa.
1917. Block, Frank B., 305 Tabor Medical Bldg., York & Tabor Rds.
1949. Blumstein, George I., 2039 Delancey St.
1929. Bockus, Henry L., 250 S. 18th St.
1928. Boles, Russell S., Rittenhouse Plaza, 1901 Walnut St.
1923. Bond, Earl D., 111 N. 49th St.
1948. Bookhammer, Robert S., 209 Rittenhouse Claridge. (3)
1931. Bortz, Edward Le Roy, 2021 W. Girard Ave.
1921. Borzell, Francis Frank, 4940 Penn St.
1936. Bostwick, Delazon Swift, 106 Linwood Ave., Ardmore, Pa.
1928. Bothe, Frederick A., 255 S. 17th St.
1951. Boucot, Katharine R., 3300 Henry Ave. (29)
1947. Bourland, Henry S., 2219 Garret Rd., Drexel Hill, Pa.
1923. Bower, John O., 2008 Walnut St.
1954. Bowers, Paul A., 2035 Locust St. (3)
1942. Bowie, Morris A., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1907. Bradley, William Nathaniel, ~~Hotel Belgravia, 1811 Chestnut St.~~ (3) 317 N. 18th (3)
1954. Bralow, S. Philip, 2104 Delancey Pl. (3)
1942. Branen, William, Whitby & Cypress Ave., Yeadon, Pa.
1921. Bransfield, John W., 2101 Spruce St.
1948. Braun, William, 406 Cooper St., Camden, N. J.
1953. Brav, Solomon S., 5575 N. Park Ave. (41)
1953. Breckenridge, Robert L., Our Lady of Lourdes Hosp., 1600 Haddon Ave., Camden 3, N. J.
1951. Brinton, S. Jervis, St. George's Apt., Ardmore, Pa.
1946. Briscoe, Clarence Conway, 811 Spruce St. (7)
1953. Brobeck, John R., Univ. of Pa. School of Medicine. (4)
1952. Brody, Morris W., 1930 Chestnut St.
1948. Brogan, Edmund J., Thomas Wynne Apartment, Wynnewood, Pa.
1917. Bromer, Ralph S., 723 Woodfield Rd., Villa Nova, Pa.
1953. Brooke, John A., 1431 Spruce St. (2)
1936. Brown, Clark E., Lankenau Hospital.
1932. Brown, Claude P., 1930 Chestnut St.
1939. Brust, Raymond W., 4710 Chester Ave.
1953. Bucher, Robert M., 3401 N. Broad St. (40)
1952. Bumgardner, Heath D., 3701 N. Broad St. (40)
1953. Burbidge, J. Raymond, 163 Nassau St., Princeton, N. J.
1940. Burnett, W. Emory, 3401 N. Broad St.
1954. Burros, Harry M., 255 S. 17th St. (3)
1941. Butler, Miriam, Watersmeet, Glen Mills, Pa.

1907. Cadwalader, Williams B., 133 S. 36th St.
1928. Campbell, Edward H., 133 S. 36th St.
1952. Campbell, Edward W., 1318 Medical Arts Bldg.
1944. Campion, Richard J., Penllyn Rd., Springhouse, Ambler, Pa.
1931. Cantarow, Abraham, 1025 Walnut St.
1952. Cardone, John B., 831 N. 63rd St.
1935. Carey, Lawrence S., 330 S. 9th St.
1931. Cariss, Walter L., 51 N. 39th St. (4)
1956. Carnwath, John Wallace, Summit & Highland Aves., Jenkintown, Pa.
1930. Carpenter, Chapin, 1930 Chestnut St.
1917. Carson, John B., Newton Square, Pa.
1956. Carty, James Byron, 133 S. 36th St. (4)
1956. Casey, Paul R., Cheltenham & Large Sts. (24)
1937. Castallo, Mario A., 1621 Spruce St.
1943. Castigliano, S. Gordon, 853 Mt. Pleasant Rd., Bryn Mawr, Pa.
1949. Caswell, H. Taylor, 3401 N. Broad St.
1954. Catenacci, Alfred J., 1417 S. Broad St. (47)
1954. Cathcart, Richard T., 739 S. Broad St. (47)
1950. Chamberlain, Richard H., 3400 Spruce St.
1933. Chamberlain, W. Edward, Temple University Hospital.
1939. Chamberlin, George W., Reading Hospital, Reading, Pa.
1900. Chance, Burton, 317 S. 15th St.
1945. Chance, Burton, Jr., 1726 Spruce St.
1954. Charny, Charles W., 2039 Delancey Pl. (3)
1947. Chouké, Kehar S., P.O. Box 447, Kecoughton, Va.
1945. Cianfrani, Theodore, 1930 Chestnut St.
1939. Ciccone, Emmet F., 2021 Murray St.
1951. Clagett, Augustus H., Jr., 303 Lighthouse Rd., Wilmington 3, Del.
1929. Clark, Eliot R., 315 S. 41st St.
1934. Clark, Jefferson Hamer, 101 Maple Ave., Wyncote, Pa.
1951. Clark, John K., 36th & Spruce Sts. (4)
1947. Clark, Thomas Williams, 9501 Germantown Ave. (18)
1947. Classen, Charles H., Cushman Rd. and Lancaster Ave., Rosemont, Pa.
1910. Cloud, J. Howard, 111 St. Pauls Road, Ardmore, Pa.
1903. Coates, George Morrison, 1721 Pine St.
1941. Cohen, J. Gershon, 255 S. 17th St.
1951. Cohen, Leon Solis-, 1422 Chestnut St.
1949. Cohen, Louis B., 1320 Arrott St.
1907. Cohen, Myer Solis-, 2110 Spruce St.
1953. Cohen, Robert V., 520 Spring Ave., Elkins Park 17, Pa.
1955. Colcher, Abraham E., 269 S. 19th St. (3)
1934. Colgan, Robert C., ℅ Abrams, RD #1, Bridgeport, Pa.
1934. Collins, Leon Howard, Jr., 133 S. 36th St.
1943. Colonna, Paul C., Univ. of Pa. Hospital.
1949. Conger, Kyril B., 3401 N. Broad St.
1945. Coonel, Pauline, 47 E. Mt. Pleasant Ave.
1930. Cooper, David A., 1520 Spruce St.
1953. Cooper, Donald R., 133 S. 36th St. (4)
1947. Coppolino, John F., 1807 S. Broad St.
1952. Corbit, John D., Jr., 3717 Chestnut St.
1941. Cornelius, Chalmers E., 119 Summit Ave., Jenkintown, Pa.
1911. Cornell, Walter S., Board of Public Education, Parkway and 21st St.
1945. Corrigan, Patrick H., 1720 S. Broad St., Trenton, N. J.

1914. Corson, Edward F., 136 S. 16th St.
1946. Costello, Thomas J., 131 Pennsylvania Avenue, Bryn Mawr, Pa.
1924. Cowan, Alfred, 1930 Chestnut St.
1940. Cowan, Thomas H., 1930 Chestnut St.
1904. Craig, Frank A., 429 Montgomery Ave., Haverford, Pa.
1907. Crampton, George S., 2031 Locust St.
1947. Crane, A. Reynolds, 807 Spruce St.
1937. Crane, Martin P., 2412 N. Broad St.
1920. Creighton, William J., 37 S. 20th St.
1952. Crellin, J. Antrim, 1930 Chestnut St.
1941. Creskoff, Adolph J., 3400 Spruce St.
1955. Crist, Walter A., 211 N. 5th St., Camden, N. J.
1921. Crossan, Edward T., R.D. #1, Conshohocken, Pa.
1937. Crump, Jean, 3300 Henry Ave. (29)
1937. Curtis, Lawrence, 535 Cornell Ave., Swarthmore, Pa.
1934. Custer, R. Philip, 126 Grays La., Haverford, Pa.
1938. Dannenberg, Arthur M., 235 S. 15th St.
1951. Daugherty, Earl A., 2025 W. Girard Ave.
1953. Davie, John H., 269 S. 19th St. (3)
1947. Davis, C. Nelson, 133 South 36th St.
1936. Davis, David M., 255 S. 17th St.
1951. Davis, J. Wallace, 135 S. 18th St.
1937. Davis, Perk Lee, P.O. Box 701, Paoli, Pa.
1935. Deaver, J. Montgomery, Lankenau Medical Bldg., (31)
1957. Decker, John Paul, Pennsylvania Hospital (7)
1947. Dehne, Theodore L., Adams Avenue and Roosevelt Blvd.
1935. Deibert, Irvin Elmer, 538 Cooper St., Camden, N. J.
1954. Deitrick, John E., 1025 Walnut St. (7)
1923. De Long, Perce, 37 S. 20th St.
1955. De Long, Samuel L., 37 S. 20th St. (3)
1952. DeLuca, Charles Q., 255 S. 17th St.
1952. De Orsay, Ralph H., 1241 Lindale Ave., Drexel Hill, Pa.
1951. De Palma, Anthony F., 248 S. 21st St.
1928. Dewees, A. Lovett, Glen Mills, Del. Co., Pa.
1956. Dietrich, Herbert James, Jr., 2035 Delancey Place (3)
1952. Digilio, Victor A., 2200 St. James Place.
1924. Dillon, Edward S., Conshohocken State Rd., Penn Valley, Narberth, Pa.
1953. Dixon, James P., Dept. of Public Health, City Hall Annex. (7)
1920. Doane, Joseph C., 617 W. Hortter St.
1948. Dohan, Francis Curtis, 80 Princeton Road, Cynwyd, Pa.
1954. Donaldson, James B., 235 N. Broad St. (2)
1946. Donnelly, Andrew J., 33rd and Powelton Ave.
1942. Donnelly, Edward J., 1321 Spruce St.
1933. Donnelly, Joseph C., 6832 Ogontz Ave.
1937. Donnelly, Robert T. M., 255 S. 17th St.
1954. Downing, Daniel F., 8864 Norwood Ave., (18)
1952. Drayer, Calvin S., 111 N. 49th St.
1949. Dripps, Robert D., 3400 Spruce St.
1935. Duane, William, Jr., 2109 Spruce St. (3)
1956. Dubin, Isadore N., Woman's Medical College (29)
1944. Dublin, George J., 1930 Chestnut St.
1944. Dugger, John H., Episcopal Hospital (25)
1935. Duncan, Garfield G., 330 S. 9th St.

1937. Dunn, Charles W., 265 S. 19th St.
1951. Dunne, Francis S., 133 S. 36th St.
1953. Dupler, Donald A., 4028 Walnut St. (4)
1942. Durant, Thomas M., 3401 N. Broad St.
1947. Durkin, John Keenan, 34 W. Montgomery Ave., Ardmore, Pa.
1942. Dyer, W. Wallace, Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1935. Eads, John T., 2029 Delancey St.
1936. Easby, Mary Hoskins, Woman's Hospital.
1948. Eaton, Francis H., 4007 Chestnut St.
1937. Edeiken, Joseph, 2130 Delancey Pl.
1955. Edwards, Margaret Hay, 224 W. State St., Trenton, N. J.
1944. Eger, Sherman A., 2029 Delancey St.
1949. Egoville, John W., 720 N. 63rd St.
1944. Ehrich, William E., 540 W. Hortter St.
1956. Eiman, John W., Abington Memorial Hospital, Abington, Pa.
1953. Eisenberg, Isadore J., 1520 N. 2d St., Harrisburg, Pa.
1946. Elfman, Louis Kenneth, 6330 Lebanon Avenue.
1949. Elkinton, J. Russell, Oak Lane, Moylan, Pa.
1955. Ellis, Samuel, 541 S. 46th St., (43)
1939. Ellis, Van Mashburn, 1528 Spruce St. (2)
1928. Ellison, Richard T., 8601 Stenton Ave.
1936. Ellson, J. Vernon, 807 Spruce St.
1904. Elmer, Walter G., 1801 Pine St.
1937. Elsom, Kendall A., Maloney Clinic Bldg., 36th & Spruce St. (4)
1934. Ely, William C., 3912 Chestnut St.
1932. Engel, Gilson C., Lankenau Medical Bldg. (31)
1945. English, O. Spurgeon, 3401 N. Broad St. (40)
1942. Erb, William H., 133 S. 36th St.
1950. Ersner, Matthew S., 1915 Spruce St.
1954. Evans, Harry D., Jr., 250 S. 18th St. (3)
1948. Everts, Glenn S., 5515 Wissahickon Ave., Apt. D-403.
1955. Eynon, Harold K., 538 Cooper St., Camden, N. J.
1946. Farell, David M., 1912 Spruce St.
1903. Farr, Clifford B., Bryn Mawr, Pa.
1945. Farrar, George Elbert, Jr., 528 Scott Rd., Gladwyne, Pa.
1953. Farrell, Harry L., 1930 Chestnut St. (3)
1930. Farrell, John T., Jr., 255 S. 17th St.
1935. Ferguson, Lewis Kraeer, 133 S. 36th St.
1936. Fetter, Ferdinand, 322 S. 21st St.
1945. Fetter, John S., 842 Worrell Rd., Jenkintown, Pa.
1935. Fetter, Theodore R., 255 S. 17th St.
1924. Fewell, Alexander G., 1924 Pine St.
1952. Fields, Harry, 133 S. 36th St.
1955. Finestone, Albert J., 2039 Pine St. (3)
1943. Finkelstein, Arthur, 480 Latch's Lane, Merion, Pa.
1955. Finkelstein, David, 1930 Chestnut St. (3)
1955. Finley, John K., 527 Welsh St., Chester, Pa.
1954. Finn, Joseph L., 7109 Rising Sun Ave. (11)
1947. First, Arthur, 1714 Spruce St.
1954. Fischer, Carl C., Germantown Professional Bldg. (44)
1945. Fiske, Frederick A., 1530 Locust St.
1956. Fite, Franklin K., Germantown Hospital (44)
1952. Fitts, William T., Jr., 3400 Spruce St.

1928. Fitz-Hugh, Thomas, Jr., 2016 Delancey Pl.
1952. Flexner, Louis B., Univ. of Pa. School of Medicine (4)
1928. Flick, John B., 819 Black Rock Rd., Gladwyne, Pa.
1954. Flick, John B., Jr., Byrn Mawr Medical Bldg., Bryn Mawr, Pa.
1952. Flinn, Lewis B., 503 Delaware Ave., Wilmington, Del.
1939. Flippin, Harrison F., Lankenau Hospital, (30)
1951. Ford, Elbert S. C., 255 S. 17th St.
1954. Forster, H. Walter, Jr., 37 S. 20th St. (3)
1941. Fox, C. Calvin, 1806 Spruce St.
1906. Fraley, Frederick, 6005 Overbrook Ave. (31)
1955. Frayer, William C., 313 S. 17th St. (3)
1941. Frazier, William Doane, 419 Gilpin Rd., Narberth, Pa.
1952. Freed, Herbert, 255 S. 17th St.
1956. Freeman, Joseph T., 1530 Locust St. (2)
1953. Fried, Paul H., 1812 Spruce St. (3)
1955. Friedenberg, Zachary B., 133 S. 36th St. (4)
1951. Friedman, Paul Sigmund, 1422 Chestnut St.
1933. Fritch, James Scott, 269 S. 19th St.
1937. Fritz, Herbert H., Pennswood Rd., Bryn Mawr, Pa.
1953. Fruchter, Joseph M., 2104 Pine St. (3)
1940. Fry, Kenneth E., 1719 Rittenhouse Sq.
1935. Fry, Wilfred Eyles, 1930 Chestnut St.
1937. Furlong, Thomas F., Jr., Times Medical Building, Ardmore, Pa.
1954. Gambescia, Joseph M., 255 S. 17th St. (3)
1935. Gammon, Geo. D., Univ. of Pa. Hospital (4)
1951. Garlichs, Richard W., 216 N. Manoa Road, Havertown, Pa.
1931. Garner, Vaughn C., Germantown Professional Building
1953. Garnet, James D., 330 S. 9th St. (7)
1950. Garvin, Eugene J., 533 S. 46th St., (43)
1953. Geckeler, Edwin O., 269 S. 19th St. (3)
1952. Gefter, William I., 366 Penn Rd., Wynnewood, Pa.
1935. Geist, Donald C., 1930 Chestnut St.
1955. Gelfand, David, 1722 Pine St., (3)
1954. German, George B., 429 Cooper St., Camden, N. J.
1955. Gettes, Bernard C., 128 Overhill Rd., Cynwyd, Pa.
1934. Gibbon, John H., Jr., 1025 Walnut St.
1939. Gibson, Glen Gregory, 2031 Locust St.
1944. Gifford, Edward S., Jr., 1913 Spruce St.
1954. Gilbert, Philip D., Cooper Hospital, Camden, N. J.
1954. Giletto, Basil J., 2020 Locust St. (3)
1920. Gill, A. Bruce, 1603 Normandy Drive, Mt. Dora, Fla.
1956. Gill, Robert J., 801 Spruce St. (7)
1927. Gilmour, William R., 6616 Woodland Ave. (42)
1952. Gilpin, Sherman F., 3701 N. Broad St.
1949. Ginsburg, Isadore W., 3401 N. Broad St. (40)
1931. Giordano, Anthony A. S., 1819 S. Broad St.
1954. Gislason, Gerhard J., Medical Arts Bldg. (2)
1954. Glover, Robert P., 269 S. 19th St. (3)
1953. Godfrey, Lincoln, 255 S. 17th St. (3)
1956. Goldberg, Harry, 249 N. Broad St. (2)
1945. Goldberg, Samuel J., 1723 Pine St.
1933. Goldburgh, Harold L., 1932 Spruce St.
1935. Goldsmith, N. Ralph, 1351 Tabor Rd.

1949. Gopadze, Illarion I., 1809 Delancey Pl.
1956. Goracci, Armando F., 133 S. 36th St. (4)
1928. Gordon, Burgess L., Woman's Medical College of Pa.
1937. Gordon, William, 5345 Spruce St.
1956. Gouley, Benjamin, 5577 N. Park Ave. (41)
1941. Gouterman, Joseph I., 1930 Chestnut St.
1957. Grahn, Henry Victor, 5132 Chester Ave. (43)
1926. Grant, Francis Clark, Univ. of Pa. Hospital (4)
1940. Greene, Lloyd B., 136 S. 16th St.
1952. Greening, Roy R., 3400 Spruce St.
1955. Greenstein, Raphael H., 1710 Pine St. (3)
1934. Griffith, John Q., Jr., 6 N. Fredericksburg Ave., Margate, N. J.
1945. Griffiths, John E., Mermont Apartments, Bryn Mawr, Pa.
1941. Groff, Robert A., 1930 Chestnut St.
1952. Grotzinger, Paul J., 2121 Valley Road, Huntingdon Valley, Pa.
1952. Grove, D. Dwight, 230 N. Broad St.
1945. György, Paul, Univ. of Pa. School of Medicine (4)
1935. Hadden, Samuel B., 250 S. 18th St. (3)
1951. Hafkenschiel, Joseph H., 3600 Spruce St.
1945. Hahn, George A., 255 S. 17th St.
1935. Haines, Harlan F., 134 S. State Rd., Upper Darby, Pa.
1955. Hallahan, John D., 104 W. Front St., Media, Pa.
1951. Hallett, Joseph W., 1001 Medical Arts Bldg., 16th & Walnut Sts.
1939. Hamblock, Leonard C., 1632 Spruce St.
1954. Hand, B. Marvin, 269 S. 19th St. (3)
1938. Hand, John G., 1724 Pine St.
1947. Hanes, William James, 218 E. Beechtree Lane, Wayne, Pa.
1956. Harbert, Frederick, Jefferson Hospital (7)
1952. Harer, W. Benson, State Rd. & Rogers Ave., Bywood, Pa.
1951. Harkins, Herbert P., 1930 Chestnut St.
1932. Harris, Stanley E., 229 Maple Ave., Delanco, N. J.
1948. Harris, T. N., 2222 N. 53rd St.
1929. Harrison, Francis G., 1900 Spruce St.
1933. Harrison, William John, 135 S. 17th St.
1926. Hartmann, Fred L., 1914 Pine St.
1946. Harvey, Edith E., 406 York Rd., Jenkintown, Pa.
1947. Harvey, Rolfe Marsh, 669 Mill Rd., Villanova, Pa.
1935. Haskell, Benjamin F., 1427 Spruce St.
1946. Hatfield, C. Alexander, 330 S. 9th St.
1947. Havens, Walter Paul, Jr., 300 Cherry Lane, Wynnewood, Pa.
1947. Hawthorne, Herbert Reid, 255 S. 17th St. (3)
1952. Hayllar, Benjamin L., 801 Medical Arts Bldg.
1946. Hendrickson, Frank O., 1737 Chestnut St. (3)
1953. Henry, George C., 3400 N. Broad St. (40)
1944. Herbut, Peter A., Jefferson Medical College Hospital
1953. *Herrick, William C., 4632 Denwood St., La Mesa, California
1951. Herrman, Clinton S., 1301 Spruce St., (7)
1954. Herron, James R., 573 Stevens St., Camden 3, N. J.
1924. Hewson, William, 1614 Locust St.
1949. Heyl, W. Meredith, 100 W. Coulter St.
1956. Hildreth, Eugene A., University of Penna. Hospital (4)

* Military service.

1952. Hinkson, DeHaven, 329 N. 40th St.
1924. Hirst, John C., 2d., 500 N. 20th St.
1943. Hitschler, William J., Bethlehem Pike & Summit (18)
1944. Hneleski, Ignatius S., 802 S. 48th St.
1943. Hockaday, Agnes, 316 Shadeland Ave., Drexel Hill, Pa.
1939. Hodes, Philip J., Univ. of Pa. Hospital (4)
1947. Hodges, John H., 1025 Walnut St.
1954. Hoeffel, Joseph M., Jr., 330 S. 9th St. (7)
1948. Hoffman, George L., Jr., 133 S. 36th St.
1954. Hollander, George, 3500 Vista St. (36)
1949. Hollander, Joseph L., 36th & Spruce Sts. (4)
1932. Hollingsworth, I. Pemberton, 411 N. Walnut St., West Chester, Pa.
1951. Hollis, Charles B., 1930 Chestnut St.
1952. Holloway, Edward E., 1739 W. Montgomery Ave.
1949. Hopkins, Henry U., Garden Court Apts. 47th & Pine Sts.
1953. Horan, Charles A., 734 N. 63rd St. (31)
1946. Horan, Gerald W., 5819 Chester Ave.
1947. Horwitz, Orville, Hospital of University of Pa. (4)
1953. Hostelley, W. Vernon, 1221 Harrison St. (24)
1950. Houlihan, Carl T., 728 S. 60th St.
1944. Housel, Edmund L., 255 S. 17th St.
1928. Houser, Karl Musser, 2035 Delancey Pl.
1948. Howland, Alvin Wilcox, 255 S. 17th St.
1946. Howson, John Yeatts, 316 Lancaster Ave., Wayne, Pa.
1951. Hubbard, John P., University of Penna., School of Medicine.
1947. Huber, John Franklin, Temple University School of Medicine. (40)
1937. Hughes, Joseph, 111 N. 49th St.
1939. Hughes, P. Boland, 419 Hillbrook Rd., Bryn Mawr, Pa.
1951. Hundley, J. Warren, 3818 Chestnut St.
1954. Hunsicker, William C., Jr., 255 S. 17th St. (3)
1946. Hunt, William T., Jr., 1930 Chestnut St.
1921. Hunter, Robert John, 928 N. 63rd St. (31)
1952. Hyman, Harold L., 3401 N. Broad St. (40)
1950. Imbriglia, Joseph E., 329 Shadeland Ave., Drexel Hill, Pa.
1952. Imperiale, C. Charles, 1331 Pine St.
1935. Ingleby, Helen, Jewish Hospital, York & Tabor Rds.
1949. Ingraham, Norman R., Jr., Stenton and Whitemarsh Ave.
1951. Isard, Harold J., Mt. Sinai Hospital, 5th & Reed Sts.
1951. Israel, Harold L., 304 S. 19th St. (3)
1947. Israel, S. Leon, 2116 Spruce St.
1952. Iverson, Preston C., 1930 Chestnut St.
1921. Ivy, Robert H., 104 Dalton Rd., Paoli, Pa.
1917. Jackson, Chevalier, 3401 N. Broad St.
1932. Jackson, Chevalier L., 3401 N. Broad St.
1934. Jacobs, Maurice, 1831 Delancey Place.
1947. Jaeger, Rudolph, Jefferson Medical College Hospital.
1952. Janton, O. Henry, 2008 Walnut St. (3)
1941. Jeffers, William A., University of Pa. Hospital. (4)
1955. Jernstrom, Paul H., Jefferson Hospital. (7)
1942. Johnson, Julian, 406 Conshohocken State Rd., Narberth, Pa.
1938. Johnson, Thomas A., 135 S. 18th St. (3)
1952. Jonas, Karl C., 2601 Parkway.
1918. Jonas, Leon, 255 S. 17th St.

1924. Jones, Harold W., 1930 Chestnut St.
1936. Kain, Thomas M., 403 Cooper St., Camden, N. J.
1948. Kaplan, Louis, 2040 Pine St.
1938. Kasper, Kelvin A., 135 S. 18th St.
1945. Katz, G. Henry, 111 N. 49th St.
1941. Kauffman, M. Luther, Medical Arts Bldg., Jenkintown, Pa.
1947. Kay, Calvin Frederick, Univ. of Pa. Hospital. (4)
1954. Kaye, Robert, Children's Hospital, 1740 Bainbridge St. (46)
1947. Keefer, George Pfahler, 3708 Woodland Ave., Drexel Hill, Pa.
1949. Keiserman, Joseph, 5460 Baltimore Ave.
1935. Kelly, George F. J., N. E. Cor. 20th and Chestnut Sts.
1932. Kelly, Herbert T., 1900 Spruce St.
1912. Kelly, Thomas C., 105 School Lane.
1941. Kennedy, Patrick J., 32 Hampden Rd., Upper Darby, Pa.
1947. Kennedy, William Blair, Univ. of Pa. School of Medicine. (4)
1948. Kern, Franklin Moore, 903 Nicholson Rd., Wynnewood, Pa.
1921. Kern, Richard A., Temple University Hospital.
1935. Keyes, Baldwin L., 2031 Locust St.
1930. Kimbrough, Robert A., Jr., 807 Spruce St.
1936. King, Orville C., 330 S. 9th St.
1952. Kirshner, Jacob J., 1930 Chestnut St.
1920. Klauder, Joseph V., 1934 Spruce St.
1920. Klein, Thomas, 250 S. 18th St.
1952. Kleinbart, Morris, 1922 Pine St.
1954. Kligman, Albert M., 36th & Spruce Sts. (4)
1934. Kline, Oram R., 514 Cooper St., Camden, N. J.
1948. Klingensmith, Paul O., 133 S. 36th St.
1956. Klinghoffer, June F., 5501 Greene St. (44)
1932. Klopp, John W., Gwynedd Valley, Pa.
1919. Knipe, Norman L., 514 Baird Rd., Merion, Pa.
1945. Kobler, H. B., 658 N. 63rd St.
1914. Kolmer, John A., Cynwyd, Pa.
1936. Konzelmann, Frank Williamson, 12 E. Lenox St., Chevy Chase, Md.
1949. Koop, C. Everett, 1740 Bainbridge St.
1952. Kornblueh, Igho H., Welsh Rd., & Verree Rd. (15)
1941. Krall, J. Thomas, 1927 Spruce St.
1948. Kramer, David W., 2007 Pine St.
1954. Krasnoff, Sidney O., Tabor Medical Bldg. (41)
1944. Krauss, Frederick Harold, 16th & Walnut Sts.
1952. Kravitz, Charles H., 1726 Widener Pl.
1949. Kremer, David N., 1918 Pine St.
1949. Kressler, Robert J., 330 S. 9th St.
1941. Krewson, William E., 3rd, 1930 Chestnut St.
1914. Krumbhaar, Edward B., Univ. of Pa. School of Medicine. (4)
1953. Krumperman, LeRoy W., 3401 N. Broad St. (40)
1947. Kuhlenbeck, Hartwig, Woman's Medical College.
1947. La Boccetta, Alfred Charles, 2nd and Luzerne Sts.
1952. Lachman, John W., 3401 N. Broad St. (40)
1949. La Clair, Charles H., Jr., 1021 W. Main St., Norristown, Pa.
1952. Lafferty, Henry D., 37 S. 20th St.
1951. Lame, Edwin L., 51 N. 39th St.
1950. Lamont, Austin, 3400 Spruce St. (4)
1946. Lampe, William T., 4207 Tyson Ave.

1952. Lang, Warren R., 1012 Walnut St. (7)
1941. Langner, Paul H., Jr., 1208 Edmonds Ave., Drexel Hill, Pa.
1945. Lansbury, John, 3401 N. Broad St. (40)
1926. Laws, George M., 1907 Spruce St.
1936. Leaman, William G., Jr., Presidential Apts: Adams House B-909.
1950. Learner, Norman, 255 S. 17th St.
1920. Leavitt, Frederic Headley, 1527 Pine St.
1941. Leberman, Paul R., 136 S. 16th St.
1942. Lehman, James A., 255 S. 17th St.
1952. Lehman, J. Stauffer, 230 N. Broad St.
1951. Leivy, Frank E., 1321 Spruce St.
1944. Lell, William A., 333 S. 18th St. (3)
1935. Lemmon, William T., 133 S. 36th St.
1943. Leopold, Irving H., 1930 Chestnut St.
1955. Leopold, Robert L., 269 S. 19th St. (3)
1920. Leopold, Simon S., 269 S. 19th St. (3)
1944. Lettiere, Anthony J., 425 E. State St., Trenton, N. J.
1933. Levering, J. Walter, Abington Memorial Hospital, Abington, Pa.
1915. Lewis, Fielding O., Providence Road, Media, Pa.
1938. Lewis, James P., 3815 Chestnut St.
1948. Lieber, Marshall M., 1025 Walnut St.
1955. Lieberman, George E., 2019 Pine St. (3)
1948. Lieberman, Louis M., 923 Belmont Ave.
1956. Likoff, William, 249 N. Broad St. (2)
1940. Limberger, William A., 301 S. Church St., West Chester, Pa.
1938. Lindauer, M. August, 133 S. 36th St.
1956. Lindquist, John N., 422 Sabine Ave., Wynnewood, Pa.
1927. Lindsey, Walter H., 810 W. Dauphin St.
1936. Lintgen, Charles, 1930 Chestnut St.
1953. Lipsius, Edward I., 319 S. 16th St. (3)
1945. Lisker, Samuel, 255 S. 17th St. (3)
1944. Livezey, Mary M., 7200 Cresheim Rd.
1936. Llewellyn, Thomas H., 910 N. 63rd St.
1907. Lodholz, Edward, The Fairfax, 43rd & Locust Sts.
1931. Loewenberg, Samuel A., 1905 Spruce St.
1951. Long, Joseph P., 1930 Chestnut St.
1935. Long, William L., 2025 Walnut St.
1931. Longaker, Edwin P., 41 E. Montgomery Ave., Ardmore, Pa.
1951. Lorber, Stanley H., 3701 N. Broad St. (40)
1942. Lownes, John B., 1303 W. Tabor Rd. (41)
1936. Lucchesi, Pascal Francis, 601 E. Gorgas Lane.
1932. Lukens, Francis D. W., Univ. of Pa. Hospital. (4)
1930. Lukens, Robert M., 1308 W. Hunting Park Ave.
1939. Luongo, Romeo A., 2054 Locust St.
1947. Lurie, Max B., Henry Phipps Institute, 7th and Lombard Sts.
1951. Luscombe, Herbert A., 136 S. 16th St.
1952. Lutman, Frank C., 100 W. Coulter St.
1919. Lynch, Frank B., Jr., 6128 Columbia Ave. (31)
1950. Lynch, J. Edward, 255 S. 17th St.
1953. Lyons, John W., 255 S. 17th St. (3)
1933. McAndrews, Leo F., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1952. McCabe, Edward S., 136 S. 16th St. (2)
1932. McCahey, James F., 1534 Pine St.

1900. McCarthy, Daniel J., 2025 Walnut St.
1936. McCarthy, Patrick A., 229 E. Price St. (44)
1935. McClenahan, William U., 1 Summit Ave.
1953. McCloskey, Joseph F., Jefferson Hospital. (7)
1955. McClure, Carroll R., 17 S. Church St., W. Chester, Pa.
1935. McConnell, James W., 7719 Parkview Rd., Upper Darby, Pa.
1934. McCouch, Grayson P., Univ. of Pa. School of Medicine (4)
1938. McCrea, Lowrain E., 1930 Chestnut St.
1954. McCrory, Wallace W., Children's Hospital, 1740 Bainbridge St. (46)
1937. McCutcheon, Morton, Cambridge Apts.
1942. McDonald, P. Robb, 1930 Chestnut St.
1953. McDonnell, William V., 1025 Walnut St. (7)
1952. McElroy, Robert C., 133 S. 36th St.
1950. McFadden, William M., 1187 E. Washington Lane.
1949. McGavic, John S., 601 Montgomery Ave., Bryn Mawr, Pa.
1945. McGee, Lemuel Clyde, Hercules Powder Company, Wilmington, Del.
1954. McGehee, Edward H., 15 E. Highland Ave. (18)
1952. McGlade, Thomas H., 719 Cooper St., Camden, N. J.
1956. McGrath, Raymond J., 1720 Spruce St. (3)
1933. McLaughlin, James S., 330 S. 9th St.
1924. McMillan, Thomas M., 1901 Walnut St. (3)
1924. McPhedran, F. Maurice, Germantown Hosp., Penn and Chew Sts.
1955. McStravog, Lawrence J., 6910 Market St., Upper Darby, Pa.
1954. MacFadyen, Bruce V., 135 S. 18th St. (3)
1943. Macfarlan, Douglas, 1805 Chestnut St.
1932. Macfarlane, Catharine, 136 S. 16th St.
1947. Machella, Thomas E., Univ. of Pa. Hospital. (4)
1950. Mackmull, Gulden, Greene & Coulter St. (44)
1949. MacNeal, Perry Scott, 330 S. 9th St.
1939. Macneill, Norman N., 5807 Chew St.
1951. Mac Neish, W. J., Medical Arts Bldg., 16th & Walnut Sts.
1955. Macy, Dorothy, Jr., 3 Beechwood Rd., Pine Ridge, Media, R.D. 3, Pa.
1935. Maeder, LeRoy M. A., 1910 Rittenhouse Sq.
1952. Mahoney, J. Francis, 250 S. 18th St.
1942. Manges, Lewis C., Jr., 2001 Delancey Place. (3)
1954. Manges, Willis E., Methodist Hospital, Broad & Wolf Sts. (48)
1936. Mann, Bernard, 2019 Pine St.
1956. Manstein, George, 1351 Tabor Rd. (41)
1953. Marbach, A. Herbert, 1307 Tabor Rd. (41)
1948. Marden, Philip Ayer, 1912 Spruce St.
1937. Margolies, Alexander, 1351 Tabor Rd.
1950. Mark, George E., 3401 N. Broad St. (40)
1950. Marshall, E. Wayne, Jr., 1520 Spruce St.
1951. Martin, William L., Hahnemann Hospital.
1952. Martucci, Albert A., 1460 E. Cheltenham Ave.
1953. Marx, Halvey E., 282 N. Lansdowne Ave., Lansdowne, Pa.
1953. Massey, Franklin C., 136 S. 16th St. (2)
1935. Matthews, Robert A., 1025 Walnut St. (7)
1939. May, Hans, 255 S. 17th St.
1951. Mayock, Robert L., 3600 Spruce St. (4)
1934. Mecray, Paul M., 405 Cooper St., Camden, N. J.
1952. Mecray, Paul, Jr., 405 Loucroft Ave., Haddonfield, N. J.
1951. Medinger, Frederick G., 255 S. 17th St.

1955. Melnick, Theodore, 1152 N. 63rd St. (31)
1941. Mendell, Theodore H., 2023 Spruce St.
1951. Mendelssohn, Edwin, 255 S. 17th St.
1949. Menkin, Valy, 3401 N. Broad St.
1943. Meranze, David R., 1031 Lakeside Ave.
1956. Merves, Louis, 1930 Chestnut St. (3)
1955. Mervine, Thomas B., 133 S. 36th St. (4)
1955. Meyer, Eugene A., 427 Cooper St., Camden, N. J.
1937. Meyer, George Phillip, 410 Haddon Ave., Camden, N. J.
1956. Miller, Bernard Joseph, 340 S. 15th St. (3)
1935. Miller, Ford A., 4016 Chestnut St.
1946. Miller, Franklin R., Snyder-Jones Clinic, Winfield, Kan.
1939. Miller, Malcolm W., Lankenau Medical Bldg. (31)
1939. Miller, Merle M., 6013 Greene St.
1932. Miller, M. Valentine, 114 W. Phil-Ellena St.
1921. Miller, T. Grier, 133 S. 36th St.
1955. Miller, William H., Fitzgerald Mercy Hospital, Darby, Pa.
1952. Minehart, John R., 4821 Germantown Ave.
1952. Mintz, S. S., 1930 Chestnut St., (3)
1937. Missett, Joseph Vincent, Jr., 2031 Locust St.
1904. Mitchell, Charles Franklin, 2003 Pine St.
1950. Mitchell, John McK., Univ. of Pa. School of Medicine. (4)
1952. Mitchell, Robert McNair, 330 S. 9th St.
1932. Mohler, Roy W., 1806 Spruce St.
1936. Montgomery, Hugh, 119 Glenn Road, Ardmore, Pa.
1936. Montgomery, John B., 1930 Chestnut St.
1932. Montgomery, Thaddeus L., 2031 Locust St.
1935. Moore, John Royal, 3401 N. Broad St.
1947. Moore, Matthew Thibaud, 1813 Delancey Pl.
1924. Moorhead, Stirling W., 1523 Pine St.
1936. Morgan, David R., Jefferson Medical College.
1893. Morris, Elliston J., 439 Midland Ave., St. Davids, Del. Co., Pa.
1944. Morris, Harold H., Villa Nova, Pa.
1945. Morris, I. Paul, 1939 Cheltenham Ave.
1941. Mucklé, Craig Wright, 330 S. 9th St. (7)
1929. Mudd, Stuart, Department of Bacteriology, Univ. of Pa. School of Medicine.
1949. Mulholland, Stanford W., 22nd & Parkway.
1935. Mullen, Carroll Richard, 2025 Locust St.
1934. Mullen, Edward A., 472 Roxborough Ave.
1930. Murphy, Douglas P., Univ. of Pa. Hospital. (4)
1953. Murphy, Edward J., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1955. Murtagh, Frederick, 5603 Greene St. (44)
1955. Mussells, F. Lloyd, Philadelphia General Hospital (4)
1951. Myers, David, 3701 N. Broad St. (40)
1955. Nachod, Grace R., 5501 Greene St. (44)
1945. Naide, Meyer, 2034 Spruce St.
1951. Naidoff, David, 3500 Tudor St. (36)
1950. Nardone, Anthony A., 912 S. 49th St.
1948. Neese, Paul H., 17 Derwen Road, Cynwyd, Pa.
1936. Nelson, Guy M., 255 S. 17th St.
1943. Nelson, Waldo E., 615 Moreno Rd., Narberth, Pa.
1955. Nemir, Paul, Jr., 255 S. 17th St. (3)
1905. Newcomet, William S., 3501 Baring St.

1938. Newton, Zachariah B., 601 E. Sedgwick St.
1957. Nichols, Russell Lloyd, Jefferson Medical College Hospital, (7)
1935. Nicholson, Jesse Thompson, Pennsylvania Hospital. (7)
1950. Nixon, Norman, 111 N. 49th St.
1947. Noone, Ernest L., 4501 Cedar Lane, Drexel Hill, Pa.
1905. Norris, Charles C., Darby and Goshen Roads, Bryn Mawr, Pa.
1954. Norris, Charles M., 3401 N. Broad St. (40)
1938. Norris, Robert F., 513 Wynnewood Ave., Wynnewood, Pa.
1947. O'Keefe, John J., 255 South 17th St.
1954. Olsen, Axel K., 230 N. Broad St. (2)
1913. O'Neal, Alexander Hay, St. Davids, Pa.
1949. O'Neill, James F., 140 Roslyn Ave., Glenside, Pa.
1954. O'Neill, Thomas J. E., 269 S. 19th St. (3)
1947. Ornsteen, A. M., 2007 Delancey Pl.
1947. Ornston, Darius Gray, 36 Carpenter Lane.
1936. Orr, Theodore E., 1930 Chestnut St.
1955. Ottenberg, Donald J., 3519 N. Broad St. (40)
1913. Outerbridge, George W., 1927 Spruce St.
1949. Padis, Nicholas, 255 S. 17th St.
1954. Palmer, Louis H., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1909. Parish, Benjamin Dores, R.D. #1, Ambler, Pa.
1945. Park, Felix Roman, Medical Arts Bldg., Tulsa, Okla.
1940. Parker, Alan P., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1948. Parkhurst, Leonard Woods, 330 S. 9th St.
1944. Paschkis, Karl E., Jefferson Medical College.
1952. Paxson, Newlin F., 250 S. 18th St.
1932. Payne, Franklin L., Univ. of Pa. Hospital.
1954. Pearce, Alexander E., 1420 Race St. (2)
1943. Pearson, Gerald H. J., Presidential Apts.—Adams House.
1954. Pearson, Manuel M., 111 N. 49th St. (39)
1952. Peck, Roy I., 3400 Spruce St.
1930. Pendergrass, Eugene P., Univ. of Pa. Hospital.
1953. Penneys, Raymond, University of Pennsylvania Hospital. (4)
1914. Pepper, O. H. Perry, 945 Parks Run Lane, Villanova, Pa.
1916. Percival, Milton Fraser, 2332 S. Broad St.
1942. Perkins, William Harvey, 1025 Walnut St.
1946. Perloff, William Harry, 3521 N. Broad St.
1951. Perri, Angelo M., 814 Federal St.
1953. Persky, Abram H., 1737 Chestnut St. (3)
1940. Pessel, Johannes F., 224 West State St., Trenton, N. J.
1952. Peters, Michael, 262 W. Broad St., Telford, Pa.
1940. Pettit, Horace, Times Medical Bldg., Ardmore, Pa.
1949. Pettit, Mary DeWitt, 1930 Spruce St.
1915. Pfeiffer, Damon B., Meadowbrook, Pa.
1946. Pfeiffer, Mildred C. J., 358 Valley Rd., Merion, Pa.
1935. Phillips, Arthur W., 3904 Walnut St.
1911. Piersol, George Morris, 308 Kent Rd., Wynnewood, Pa.
1948. Pierson, Daniel B., Jr., 740 Beacon Lane, Merion, Pa.
1957. Pilling, George Platt, IV, 2600 N. Lawrence St. (33)
1933. Pillsbury, Donald M., Univ. of Pa. Hospital. (4)
1950. Pincus, Irwin J., 269 S. 19th St.
1951. Poinsard, Paul J., 2031 Locust St.
1937. Polk, David Stewart, Rosemont, Pa.

1956. Pontarelli, Domenic J., 255 S. 17th St. (3)
1953. Porreca, George A., 1912 Spruce St. (3)
1932. Porter, Roland De Lance, Abington, Pa.
1953. Posey, William C., Jr., 600 Suburban Square Bldg., Ardmore, Pa.
1951. Post, Joseph W., 1930 Chestnut St.
1951. Pote, Harry H., 4032 Walnut St.
1951. Pressman, Robert S., 170 W. Olney Ave. (20)
1947. Prickett, John A., Warrington, Bucks County, Pa.
1954. Prince, Leon N., 2025 Spruce St. (3)
1931. Pryor, Charles Allen, 255 S. 17th St.
1952. Pugh, James E., 614 Church Lane, Yeadon, Pa.
1947. Putney, Floyd Johnson, 1719 Rittenhouse Sq.
1943. Radbill, Samuel X, 7043 Elmwood Ave.
1953. Radbill, Sidney G., 37 S. 20th St. (3)
1956. Raker, John W., 8th & Spruce Sts. (7)
1945. Rakoff, Abraham Edward, 269 S. 19th St.
1953. Ralston, Edgar L., 3400 Spruce St. (4)
1931. Ramsey, Frank M., 620 E. Willow Grove Ave.
1953. Ranieri, Tito A., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1941. Rankin, Charles A., Ludlow & Heather Rd., Upper Darby, Pa.
1946. Rapoport, Milton, Children's Hospital, 1740 Bainbridge St.
1951. Rathmell, Thomas K., 446 Bellevue Ave., Trenton, N. J.
1926. Ravdin, I. S., Univ. of Pa. Hospital. (4)
1956. Ravdin, Robert Glenn, 3400 Spruce St. (4)
1954. Reagan, Lindley B., 175 Madison Ave., Mt. Holly, N. J.
1928. Reese, Warren S., 2118 Locust St.
1920. Rehfuss, Martin E., 131 St. George's Rd., Ardmore, Pa.
1921. Reiff, E. Paul, 1927 Spruce St.
1919. Reimann, Stanley P., 703 W. Phil-Ellena St.
1956. Reishtein, William A., 255 S. 17th St. (3)
1951. Rentschler, Laurence B., 5800 Ridge Ave.
1945. Rhoads, Jonathan E., Univ. of Pa. Hospital. (4)
1951. Richardson, Fred Mac D., 160 Carpenter Lane.
1919. Richardson, Russell, Phila. Tuberculosis Sanatorium, #4, Corinthian & Girard Aves.
1951. Riegel, Donald, 5110 Chester Ave.
1942. Riggs, Helena E., 150 Hewitt Rd., Wyncote, Pa.
1936. Ritter, Joseph A., 2405 N. 54th St.
1932. Robbins, Frederick R., 317 Milbank Rd., Bryn Mawr, Pa.
1952. Robbins, Robert, 3401 N. Broad St. (40)
1954. Roberts, Brooke, 3400 Spruce St. (4)
1939. Roberts, Ella, 133 S. 36th St.
1899. Roberts, Walter, ℅ W. B. Brosius, Berwyn, Pa.
1932. Robertson, Harold F., 2118 Pine St.
1954. Robertson, Hugh, 255 S. 17th St. (3)
1938. Roche, Philip Q., 255 S. 17th St.
1912. Rodman, John Stewart, 6 Matsonford Rd., Radnor, Pa.
1954. Roesler, Elizabeth Mertens-, 224 W. School House La. (44)
1955. Rogers, Fred B., 3401 N. Broad St. (40)
1934. Rogers, Harry L., 303 S. 10th St. (7)
1951. Ronis, Bernard J., 2106 Spruce St.
1948. Roscoe, Constantine R., 7226 Castor Ave.
1928. Rose, Edward, 426 Owen Rd., Wynnewood, Pa.
1936. Rose, Elizabeth Kirk, 426 Owen Rd., Wynnewood, Pa.

1952. Rose, S. Brandt, Chestnut Hill Hospital.
1946. Rosemond, George Parrott, 3401 N. Broad St. (40)
1948. Rothman, Maurice M., 1727 Spruce St.
1932. Rothrock, Harry A., West Chester, Pa.
1951. Rouse, George P., Jr., 2031 Locust St.
1952. Roxby, Bruce S., 5501 Greene St.
1937. Roxby, John B., 113 Yale Ave., Swarthmore, Pa.
1955. Roxby, John B., Jr., 4821 Germantown Ave. (44)
1949. Royster, Henry P., 3400 Spruce St.
1941. Royster, Hubert A., Jr., The Mermont, Bryn Mawr, Pa.
1956. Rubenstone, Albert I., 151 W. Luzerne St. (24)
1952. Rubin, I. Edward, 255 S. 17th St. (3)
1933. Rudolphy, Jay Besson, 230 S. 21st St.
1946. Rupp, Charles, 133 S. 36th St.
1947. Rush, Alexander, 330 S. 9th St.
1945. Rynes, Samuel E., 334 S. 21st St.
1952. Sain, Fletcher D., 8 Orchard Ave., Bristol, Pa.
1952. Salner, Nathan P., 6812 Castor Ave. (24)
1952. Saltzman, Maurice, 1923 Spruce St.
1944. Sampson, David Alan, 726 Braeburn Lane, Penn Valley, Narberth, Pa.
1954. Sampson, Martin C., 418 S. 47th St. (43)
1936. Sands, Joseph Evans, Rosemont, Pa.
1950. Sarner, Joseph B., 269 S. 19th St. (3)
1949. Saul, Leon J., Highland Ave., Media, Pa.
1908. Sautter, Albert C., Germantown Professional Bldg.
1954. Savacool, J. Woodrow, 146 W. Tulpehocken St. (44)
1955. Sawchuk, Steven, 6809 Castor Ave. (24)
1947. Saÿen, John J., 506 Montgomery Ave., Haverford, Pa.
1948. Scarano, Joseph Albert, 1432 S. Broad St.
1917. Schaeffer, J. Parsons, Daniel Baugh Institute, 307 S. 11th St.
1929. Scheffey, Lewis C., 255 S. 17th St.
1942. Scheie, Harold G., 313 S. 17th St.
1929. Schenck, Harry P., 1235 Wyngate Rd., Wynnewood, Pa.
1945. Schlezinger, Nathan S., 255 S. 17th St.
1917. Schnabel, Truman G., 1704 Pine St.
1917. Schoff, Charles H., Media, Pa.
1955. Schreader, Charles J., 318 Godfrey Ave. (20)
1952. Schulz, Norbert J., 1901 Walnut St.
1950. Schumann, Francis N., 8811 Germantown Ave.
1948. Schwarz, Gabriel A., 1711 Rittenhouse Sq.
1955. Schwegman, Cletus W., Hospital of the University of Penna. (4)
1930. Scott, John Porter, Children's Hospital, 1740 Bainbridge St.
1950. Scott, Michael, 255 S. 17th St.
1940. Scott, T. F. McNair, Children's Hospital, 1740 Bainbridge St.
1952. Seifer, Arthur F., 3401 N. Broad St.
1954. Seifter, Joseph, Wyeth Institute for Medical Research (1)
1951. Seitchik, Joseph N., 1417 Race St., Hahnemann Medical College Annex.
1952. Semisch, Charles W., III, 5329 Rising Sun Ave.
1951. Shaffer, Bertram, 1825 Pine St.
1950. Sharp, Reuben L., 719 Cooper St., Camden, N. J.
1928. Sharpless, Frederick C., Beach Haven, N. J.
1956. Shaw, Daniel L., Jr., 702 Knox Rd., Villanova, Pa.
1948. Shay, Harry, 3400 N. Broad St.

1955. Shechter, Fred R., 1923 Spruce St. (3)
1954. Shelley, Walter B., 36th & Spruce Sts. (4)
1955. Shenkin, Henry A., 255 S. 17th St. (3)
1946. Shepherd, Samuel Garfield, 2039 Pine St.
1932. Sheridan, Joyce T., 412 W. Durham St.
1956. Sherson, Jacob S., 131 Channing Ave., Malvern, Pa.
1936. Shipman, James Shelby, 255 S. 17th St.
1935. Shoemaker, Robert, 3rd, 68 Byberry Rd., Hatboro, Pa.
1946. Shoup, George Daniel, 121 W. Walnut Lane. (44)
1955. Shubin, Harry, 6601 N. 21st St. (38)
1952. Shuman, Charles R., 3401 N. Broad St.
1936. Shuster, Benjamin H., 1824 Pine St.
1949. Sidlick, David M., 255 S. 17th St.
1941. Silcox, Louis E., Lankenau Medical Bldg. (31)
1956. Sillars, Charles H., Abington Memorial Hospital, Abington, Pa.
1955. Silverstein, Alexander, 2114 Pine St. (3)
1954. Singmaster, Lawrence, Lankenau Medical Bldg. (31)
1955. Sklaroff, David M., Einstein Medical Center. (41)
1952. Skromak, Stanley J., 5108 Torresdale Ave.
1929. Smith, Austin T., 1830 Spruce St.
1955. Smith, J. Winslow, 220 N. 15th St. (2)
1933. Smith, Lauren Howe, 111 N. 49th St.
1952. Smith, Richard T., 330 S. 9th St.
1927. Smyth, Calvin Mason, Abington Memorial Hospital, Abington, Pa.
1951. Snape, William J., 573 Stevens St., Camden, N. J.
1938. Snodgrass, L. E., 709 Walnut St. (6)
1953. Snyder, G. Gordon, Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1935. Sokoloff, Martin J., 255 S. 17th St.
1940. Soloff, Louis A., 255 S. 17th St.
1950. Somerville, William J., 2022 Locust St.
1935. Sommer, George N. J., 120 W. State St., Trenton, N. J.
1944. Sommer, George N. J., Jr., 120 W. State St., Trenton, N. J.
1952. Sones, Maurice, Mt. Airy Medical Bldg.
1951. Sonneborn, Duane G., 1200 W. Erie Ave.
1928. Spaeth, Edmund B., 1930 Chestnut St.
1937. Spangler, John Luther, Devon, Pa.
1935. Spiegel, Ernest, 6807 Lawnton Ave., Oak Lane.
1955. Spitz, Eugene B., Children's Hospital (46)
1944. Stadie, William C., University of Pennsylvania Hospital. (4)
1927. Starr, Isaac, 505 Cresheim Valley Rd.
1952. Stauffer, Herbert M., 3401 N. Broad St. (40)
1952. Stayman, Joseph W., Jr., Germantown Hospital.
1945. Stecher, H. Armin, 1510 Darby Rd., Havertown, Pa.
1955. Steel, Howard H., 3401 N. Broad St. (40).
1953. Steele, Brandt F., 1640 Pine St. (3)
1952. Steele, Eleanor A., 1640 Pine St.
1952. Steiger, William A., 3401 N. Broad St. (40)
1946. Stein, Irvin, 1936 Spruce St.
1953. Stein, Raymond O., 269 S. 19th St. (3)
1936. Steinfield, Edward, N. E. Cor. 18th and Chestnut Sts.
1942. Stengel, Alfred, Jr., 160 Hodge Rd., Princeton, N. J.
1951. Sterling, Julian A., 1008 Sharpless Rd., (26)
1948. Stevens, Lloyd W., 133 S. 36th St.

1941. Stewart, Winifred B., 1930 Spruce St.
1949. Stockwell, Eunice L., 2018 Pine St.
1925. Stokes, John H., 4228 Spruce St.
1928. Stokes, Joseph, Jr., Children's Hospital, 1740 Bainbridge St.
1943. Stokes, S. Emlen, 129 Chester Ave., Moorestown, N. J.
1954. Stone, Hrant H., E. Shawmont Ave. (28)
1952. Stoner, Emery K., 222 E. Mt. Pleasant Ave.
1953. Strawbridge, Rendall R., 269 S. 19th St. (3)
1923. Strecker, Edward A., 111 N. 49th St.
1923. Stroud, William Daniel, 1011 Clinton St.
1937. Strumia, Max M., Penn Valley, Narberth, Pa.
1937. Sturgis, Margaret C., 349 Wistar Rd., Wynnewood, Pa.
1927. Sturgis, Samuel Booth, 349 Wistar Rd., Wynnewood, Pa.
1934. Summey, Thomas J., Burlington County Hosp., Mt. Holly, N. J.
1930. Sunderman, F. William, 1833 Delancey Place (3)
1936. Surver, James Miller, 1015 Walnut St.
1954. Sussman, Marcel S., 101 S. 20th St. (3)
1952. Sweeney, Francis X., 2351 E. Allegheny Ave. (34)
1944. Swenson, Paul C., 332 Cherry Lane, Wynnewood, Pa.
1955. Taggart, Harold A., 235 N. 15th St. (2)
1948. Tait, Edwin Forbes, 1324 Main St., Norristown, Pa.
1943. Tassman, Isaac S., 136 S. 16th St.
1946. Tauber, Robert, 2019 Walnut St.
1952. Taylor, Ann Gray, 6364 Germantown Ave.
1931. Taylor, Norman H., 100 W. Evergreen Ave.
1956. Templeton, John Y., III, 1025 Walnut St. (7)
1951. Theodos, Peter A., 1930 Chestnut St.
1946. Thomas, Carmen C., 1930 Chestnut St.
1952. Thompson, Charles M., 255 S. 17th St.
1927. Thorington, J. Monroe, 2031 Chestnut St.
1936. Thorp, Francis Quicksall, 4900 Penn St.
1936. Thudium, William J., 136 S. 16th St.
1954. Tindall, Dorothy D., 37 S. 20th St. (3)
1935. Tocantins, Leandro Maués, 1025 Walnut St.
1945. Toland, Joseph J., Jr., 1241 W. Lehigh Ave.
1935. Toland, Owen J., Episcopal Hospital, Front and Lehigh Ave.
1952. Tompkins, Winslow T., Beckley Memorial Hosp., Beckley, W. Va.
1952. Tondreau, Roderick L., 6470 Drexel Rd. (31)
1953. Topping, Norman H., 3446 Walnut St. (4)
1949. Tornay, Anthony S., 37 S. 20th St.
1945. Tourish, William J., 250 S. 17th St.
1936. Towson, Charles Emory, Germantown Professional Bldg.
1955. Trimpi, Howard D., 3701 N. Broad St. (40)
1954. Trommer, Philip R., 258 S. 18th St. (3)
1956. Troncelliti, Mario V., Pennsylvania Hospital, (7)
1953. Tropea, Frank, Jr., 269 S. 19th St. (3)
1947. Trueman, Robert H., 1930 Chestnut St.
1954. Truitt, R. Marshall, Jr., 740 West View St. (19)
1926. Tucker, Gabriel, 429 Montgomery Ave., Haverford, Pa.
1938. Tuft, Louis, 1530 Locust St.
1933. Tumen, Henry J., 1900 Rittenhouse Sq.
1938. Turman, Christopher M., Wyncote, Pa.
1923. Turner, Creighton H., 1731 Pine St.

1954. Turner, Linton W., 3401 N. Broad St. (40)
1952. Twining, H. Earl 154 S. Broad St., Lansdale, Pa.
1929. Tyson, Ralph M., 255 S. 17th St.
1937. Uhle, Charles A. W., Lankenau Medical Bldg. (31)
1953. Ulin, Alexander W., 230 N. Broad St. (2)
1907. Ullom, Josephus T., Carpenter and Quincy Sts.
1950. Valdes-Dapena, Antonio, 40 Lokesley Rd., Merion, Pa.
1937. Vander Veer, Joseph B., 330 S. 9th St.
1937. Van Loon, Emily Lois, 1930 Chestnut St.
1933. Vastine, Jacob H., 2nd, 136 S. 16th St.
1955. Viek, Peter, 1400 York Road, Abington, Pa.
1952. Vischer, Thomas J., 5903 Greene St.
1940. Voegelin, Adrian W., Germantown Professional Bldg.
1941. Vogel, Stoughton R., 151 W. Tulpehocken St.
1927. Wagers, Arthur J., 1429 Spruce St.
1949. Wagner, Frederick B., Jr., 800 Chauncy Road, Narberth, Pa.
1949. Wagner, Joseph A., 201 Highland Ave., Bryn Mawr, Pa.
1928. Wagoner, George W., Medical Bldg., Bryn Mawr, Pa.
1954. Wainer, Amos S., 1621 Spruce St. (2)
1938. Waldman, Joseph, 404 Meadowbrook Lane.
1955. Waldron, Jerome M., 330 S. 9th St. (7)
1952. Walker, James M., 3400 Spruce St.
1932. Walkling, Adolph A., 136 S. 16th St.
1955. Warner, Halsey F., 100 W. Coulter St. (44)
1956. Watkins, E. Lloyd, 8815 Germantown Ave. (18)
1954. Waugh, Elizabeth S., 348 Green Lane. (28)
1933. Waygood, James J., 736 Westview St. (19)
1952. Weaver, Harry S., Jr., 37 S. 20th St.
1955. Weaver, Robert L., 530 Walnut St. (5)
1941. Weaver, Ruth H., 2601 Parkway.
1953. Weber, Lennard L., 255 S. 17th St. (3)
1930. Weeder, S. Dana, 250 W. Tulpehocken St.
1920. Weidman, Fred D., 20 Tenby Rd., Havertown, Pa.
1954. Weiner, Louis H., 4025 Girard Ave. (4)
1952. Weinstein, George L., 255 S. 17th St.
1954. Weinstock, Horace L., 329 S. 18th St. (3)
1933. Weiss, Benjamin P., The Lenox, 13th and Spruce Sts.
1923. Weiss, Edward, 269 S. 19th St.
1950. Weiss, Sidney, 1930 Chestnut St.
1951. Welty, Jack W., Montgomery Ave. & Owen Rd., Wynnewood, Pa.
1955. Wendkos, Martin H., 4015 Baltimore Ave. (4)
1935. Whelan, G. L., 2100 Walnut St.
1921. Whitaker, William, 4645 Oakland St.
1936. White, Ellen Pawling Corson-, Gladwyne, Pa.
1925. Widmann, Bernard P., 250 S. 18th St.
1954. Wieder, Henry S., Jr., 330 S. 9th St. (7)
1939. Willauer, George, 6129 Greene St.
1907. Williams, Carl, School Lane and Greene St.
1937. Williams, John C., 6370 Germantown Ave.
1920. Williams, Philip F., 353 Bala Ave., Bala-Cynwyd, Pa.
1950. Williams, R. G., Univ. of Pa. School of Medicine. (4)
1927. Williamson, Ernest G., 6353 Woodbine Ave.
1949. Willson, J. Robert, 3401 N. Broad St. (40)

1921. Wilson, George, 133 S. 36th St.
1945. Wilson, John F., 2013 Delancey Pl.
1953. Wilson, Julius L., Henry Phipps Institute, 7th & Lombard Sts. (47)
1937. Wilson, Ross B., Lankenau Medical Bldg. (31)
1949. Wilson, William W., 133 S. 36th St.
1948. Winston, Julius, 5839 Chester Ave.
1941. Wirts, C. Wilmer, 2017 Delancey St.
1953. Wohl, George T., 1227 Remington Rd., Wynnewood, Pa.
1933. Wohl, Michael G., 1727 Pine St.
1944. Wolf, Lewis R., 3474 Frankford Ave.
1918. Wolferth, Charles C., 133 S. 36th St.
1942. Wolman, Irving J., 7607 Woodlawn Ave. (26)
1893. Wood, Alfred C., 2035 Walnut St.
1950. Wood, Dorothy D., 2035 Walnut St.
1932. Wood, Francis C., 212 Laurel Lane, Haverford, Pa.
1903. Wood, Horatio C., 319 S. 41st St.
1944. Wood, H. Curtis, Jr., Skippack Pk., Whitemarsh, Pa.
1953. Woodruff, Marston T., 4940 Penn St. (24).
1928. Wright, Carroll S., 1402 Spruce St.
1943. Yawger, Nathaniel S., Exeter Rd., Haverford, Pa.
1921. Ylvisaker, Lauritz S., Fidelity Mutual Life Ins. Co., Parkway at Fairmount, (30)
1941. Young, Barton R., Germantown Hospital.
1953. Zarafonetis, Chris, 3401 N. Broad St. (40)
1955. Zatuchni, Jacob, 3401 N. Broad St. (40)
1946. Zeigerman, Joseph H., 1836 Delancey St.
1894. Zentmayer, William, 265 Forrest Rd., Merion, Pa.
1952. Zillesen, Frederick O., Jeanes Hospital.
1949. Zintl, William J., Upper Darby, Pa.
1956. Ziserman, Abraham J., 2046 Pine St. (3)
1933. Zulick, J. Donald, Abington Memorial Hospital, Abington, Pa.

Associate Fellows

ELECTED

1956. Hansen, A. Victor, 3401 N. Broad St. (40)
1951. Shorey, Jeannette McC., 532 Aragon Ave., Coral Gables, Fla.
1952. Talbot, Timothy R., Jr., 10 Chelsea Park Gardens, London S.W. 3, England.

Non-Resident Fellows

ELECTED

1912. Addison, William H. F., 286 East Sidney Avenue, Mt. Vernon, N. Y.
1947. Allbritten, Frank F., Jr., Univ. of Kansas Medical Center, Kansas City 3, Kansas.
1941. Aronson, Roland S., Medical Laboratory, Ft. McPherson, Ga.
1934. Bank, Joseph, 800 N. First Ave., Phoenix, Arizona.
1932. Behney, Charles A., Dept. of Health, Old DeWitt Rd., Lansing, Mich.
1949. Bixby, Edward W., Casey Key, R.D. Box 31-13, Nokomis, Fla.
1951. Blank, Harvey, Jackson Memorial Hospital, Miami 36, Fla.
1937. Braceland, Francis J., The Institute of Living, 200 Retreat Ave., Hartford, Conn.
1936. Brown, Charles L., 591 Montgomery St., Jersey City. (2)
1948. *Brown, Robert B., U. S. Naval Hospital, Bethesda, Md.

* Military service.

1957. Butterworth, Thomas, 411 Walnut St., Reading, Pa.
1908. Cadbury, William W., 274 W. Main St., Moorestown, N. J.
1936. Camero, Anthony R., 679 S. Westlake Ave., Los Angeles, Cal.
1948. Chapman, John P., Hotel Virginia, Palma de Mallorca, Balearic Islands, Spain.
1950. Chapple, Charles C., 1530 – 16th St., Washington, D. C.
1941. Cheleden, John, 133 Broadway, Daytona Beach, Fla.
1930. Clarke, Francis Mann, 116 New St., New Brunswick, N. J.
1926. Clerf, Louis H., 5575–8th Ave., North, St. Petersburg, Fla.
1930. Cottrell, James E., McGuire Veteran's Administration Hospital, Richmond 19, Va.
1940. Crowe, Aldrich C., 1208 Ocean Ave., Ocean City, N. J.
1947. Cutler, Norman L., 1300 Harrison St., Wilmington, Del.
1941. *Cuttle, Tracy D., U. S. Naval Hospital, Oakland 14, Calif.
1955. Daugherty, J. Arthur, 610 N. Third St., Harrisburg, Pa.
1941. Dixon, Harold M., 8511 Antler Drive, St. Louis, Mo.
1953. Eberhard, Theodore P., St. Joseph Mercy Hospital, Ann Arbor, Mich.
1951. Ellis, Mackinnon, Mountain Home Veteran's Hospital, Mountain Home, Tenn.
1954. Evans, William W., Memorial Medical Center, Williamson, W. Va.
1951. Ervin, Carl E., 240 North Third Street, Harrisburg, Pa.
1944. Estes, W. L., Jr., Bethlehem, Pa.
1952. Faller, Constantine P., 127 State St., Harrisburg, Pa.
1940. Forrester, James S., Harrisburg Polyclinic Hospital, Harrisburg, Pa.
1946. Forster, Francis M., Georgetown University Hospital, Washington, D. C.
1951. Friedland, Carl K., 271 W. Blackwell St., Dover, N. J.
1947. Gaskill, Herbert S., 250 Ash St., Denver, Colorado.
1913. Gates, Nathaniel, 10 Peterboro, Detroit, Mich.
1931. Gilman, Robert Louis, Cheyney, Pa.
1954. Godfrey, Ellwood W., Princeton Hospital, Princeton, N. J.
1947. Grady, Hugh G., Armed Forces Institute, Washington, D. C.
1952. Grieco, Reynold M., 2 W. 4th St., Williamsport, Pa.
1952. Gross, Elmer R., 817 W. Street, Wilmington, Del.
1933. Gruber, Charles M., School of Medicine, College of Medical Evangelists, Loma Linda, Calif.
1936. Guthrie, Donald, 118 S. Wilbur Ave., Sayre, Pa.
1955. Harris, John H., 1301-A N. Second St., Harrisburg, Pa.
1936. Hatch, Lerleen Clement, 2184 Ayres Ave., Akron, Ohio.
1928. Hayman, Joseph Marchant, Jr., Tufts College Medical School, Boston, Mass.
1944. Hershey, J. Ivan, VA Hospital, Shreveport, La.
1955. Hills, Arthur G., 1800 N. Bay Shore Drive, Miami, Fla.
1933. Hitzrot, Lewis H., Medical Director, Mercersburg Academy, Mercersburg, Pa.
1950. Horn, Robert C., Henry Ford Hospital, Detroit, Mich.
1938. Howell, John C., 1104 Logan Ave., Tyrone, Pa.
1936. Hughes, Brady A., 312 Euclid Ave., Mt. Brook, Birmingham, Ala.
1953. Imber, Irving, 420 Walnut St., Reading, Pa.
1952. Jones, Ralph Jr., Jackson Memorial Hospital, Miami, Florida.
1955. Jordan, Charlotte B., 519 Sarah St., Stroudsburg, Pa.
1955. Jordan, Claus G., 519 Sarah St., Stroudsburg, Pa.
1947. Kelchner, Clyde H., 1125 Turner St., Allentown, Pa.
1956. Keffer, William H., 413 Oley St., Reading, Pa.
1944. LaMotte, William O., Brook Hill Farms, Hockessin, Del.
1954. LaMotte, William O., Jr., Professional Bldg. Wilmington 3, Del.
1952. Levan, John B., 401 Oley St., Reading, Pa.
1949. Lhamon, William T., Baylor University College of Medicine, Houston, Tex.
1954. Lindenmuth, Woodrow W., VA Hospital, West Haven, Conn.
1954. Light, John J. B., 25 N. 9th St., Lebanon, Pa.

* Military service.

1948. Livingood, Clarence S., Henry Ford Hospital, Detroit 2, Mich.
1933. Long, Esmond R., Conifer, Pedlar Mills, Va.
1948. McCall, Milton L., Louisiana State Univ., New Orleans, La.
1937. McGuinness, Aims C., Room 5238, Dept. of Health, Education & Welfare, Washington, D. C.
1948. McLaughlin, John T., 1252 S. Central Ave., Glendale, Calif.
1949. Manlove, Francis R., 6015 E. 17th Ave., Denver, Colo.
1953. Margolies, Michael, 567 E. Chestnut St., Coatesville, Pa.
1955. Margolies, M. Price, 567 Chestnut St., Coatesville, Pa.
1935. Mason, James B., 40 E. Erie St., Chicago 11, Ill.
1932. Meade, Richard H., Jr., 750 San Jose Dr., Grand Rapids, Mich.
1936. Middleton, William Shainline, Veterans' Administration, Washington, D. C.
1928. Moon, Virgil H., Univ. of Miami, Coral Gables, Fla.
1949. Motley, Hurley L., 1212 Shatto St., Los Angeles, Calif.
1950. Neefe, John R., 627 Eleventh St., St. Petersburg, Fla.
1937. Nicholson, Samuel T., 2d., 642 High St., Pottstown, Pa.
1941. Nisbet, Verner, 714 Queens Rd., Charlotte 7, N. C.
1905. Norris, George W., Dimock, Pa.
1956. Oppenheimer, Albert, 224 E. Main St., Moorestown, N. J.
1926. Paul, John Rodman, Dept. Preventive Medicine, Yale University, New Haven, Conn.
1947. Pearce, Louise, Trevenna Farms, Belle Mead, N. J.
1922. Pleasants, Henry, West Chester, Pa.
1953. Raffensperger, Edward C., 2039 N. 2nd St., Harrisburg, Pa.
1938. Read, Hilton S., 5407 Atlantic Ave., Atlantic City, N. J.
1936. Reisinger, John A., 901 20th St., N.W., Washington, D. C.
1955. Rettew, Philip L., 612 Museum Rd., Reading, Pa.
1947. Rogers, Arthur Merriam, 1351 Durwood Drive, Charlotte, N. C.
1954. Roberts, Norbert J., Standard Oil Co., 30 Rockefeller Plaza, Room 2400, New York 20, N. Y.
1907. Royer, B. Franklin, 429 E. Baltimore St., Greencastle, Pa.
1953. Scanlan, Robert L., St. Vincent's Hospital, 2131 W. 3rd St., Los Angeles 57, Calif.
1945. Schell, James F., 139 W. Maple Ave., Langhorne, Pa.
1928. Schofield, Frederick S., Veteran's Admin. Hospital, Fort Wayne, Indiana.
1921. Schumann, Edward A., "Henneberg", Chalfont, Pa.
1913. de Schweinitz, George L., Curly Horn Rd., Box 13, Sasaba Star Route, Tuscon, Arizona.
1941. Shands, Alfred R., Jr., Alfred I. duPont Institute, Rockland Rd., Wilmington, Del.
1908. Shannon, Charles E. G., 9 Park St., Waterville, Maine.
1950. Shiffer, Paul H., Dreher Ave., R.D. #2, Stroudsburg, Pa.
1951. Shorey, Winston K., Jackson Memorial Hospital, Miami, Fla.
1932. Siegel, Alvin Erdreich, Medical Arts Building, Macon, Ga.
1933. Smelzer, Donald C., Lancaster General Hospital, Lancaster, Pa.
1954. Smith, Charles W., 121 State St., Harrisburg, Pa.
1929. Sponsler, Marshall B., 103 Lansdowne Road, DeWitt, N. Y.
1955. Stevenson, Theodore D., Presbyterian Board of Foreign Missions, 156 Fifth Ave., New York 10, N. Y.
1934. Stewart, Sloan G., Pacific and North Carolina Avenues, Atlantic City, N. J.
1931. Stiles, Merritt H., 820 S. McClellan St., Spokane, Wash.
1953. Stroud, Morris W., 3rd, Harvard Rd., Cleveland, Ohio.
1928. Thomas, J. Earle, College of Medical Evangelists, School of Medicine, Loma Linda, California.
1942. Thompson, Wesley D., 18 N. Main St., Lewistown, Pa.
1941. Tompkins, Pendleton, 450 Sutter St., San Francisco, California.
1950. Ullery, John C., Ohio State University, Columbus, Ohio.
1913. Vail, William Penn, Blairstown, N. J.
1947. Vastine, Mary F., R. #2, Biglerville, Pa.
1912. Vaux, Norris W., Chateau Crillon, Phila. 3.

1897. Veasey, Clarence A., 1118 W. 9th Ave., Spokane 9, Wash.
1931. Walker, Herschel Carey, 320 Park Ave., New York City, N. Y.
1936. Wilder, Theodore S., Beckley Memorial Hospital, Beckley, W. Va.
1914. Willard, De Forrest P., Sea Island, Ga.
1935. Willard, John H., Harlan Memorial Hospital, Harlan, Kentucky.
1952. Wood, Horatio C., III, 4309 Prospect Rd., Peoria, Ill.
1947. Zintel, Harold A., St. Luke's Hospital, Amsterdam Ave. & 113th St., New York 25, N. Y.

Honorary Fellows

Limited to Fifty, of Whom Twenty May Be Foreigners

American

elected

1917. Miner, Charles Howard, b.s., m.d., Member of Board of Directors, Wilkes-Barre General Hospital; Board of Health, Wilkes-Barre; Board of Directors, White Haven Sanatorium Association and Penna. Tuberculosis Society. 264 S. Franklin St., Wilkes-Barre, Pa.
1936. Richards, Alfred Newton, ph.d., sc.d., m.d. (hon.), ll.d., Emeritus Professor of Pharmacology, School of Medicine, and Associate Trustee, University of Pennsylvania.
1942. Russell, Frederick Fuller, m.d., Brig. Gen. Med. Corps, U.S.A. (Ret.). 4938 Brownsboro Road, Louisville, Kentucky.
1947. Stone, Robert Spencer, Univ. of California Medical School, San Francisco, Calif.

Foreign

1937. Dale, Sir Henry Hallett, c.b.e., f.r.s., m.a., m.d., f.r.c.p., 52 Queen Anne St., London, W. 1, England.
1922. McCarrison, Sir Robert, kt., c.b.e., m.d., d.sc., ll.d., f.r.c.p., Major-General, Indian Medical Service (retired). 18 Linton Rd., Oxford, England.
1955. Mann, Ida, m.a., d.sc., m.b., b.s., l.r.c.p., d.o.m.s., f.r.c.s., Ophthalmic Consultant to the Government of W. Australia, 56 Hobbs St., Nedlands, Perth, W. Australia.

Honorary Associate Fellows

1955. Clement, Martin W., 1964 Suburban Station Bldg. (3)
1955. Diemand, John A., President, Insurance Company of North America, 1600 Arch St. (2)

Necrological List

Resident Fellows	*Date of Election*	*Date of Death*
Thomas G. Aiken	November 4, 1914	December 22, 1956
E. J. G. Beardsley	January 1, 1908	December 27, 1956
J. Allen Bertolet	January 11, 1937	April 7, 1956
Charles W. Bonney	November 1, 1911	July 21, 1956
Robert K. H. Charr	March 1, 1939	January 29, 1956
John M. Cruice	March 2, 1904	January 4, 1956
Lowell A. Erf	January 7, 1953	January 30, 1956
Reuben Friedman	May 6, 1942	February 4, 1956
John H. Gibbon, Sr.	April 4, 1899	March 13, 1956
Frank C. Knowles	November 4, 1908	January 10, 1957
Roy L. Langdon	May 8, 1933	December 21, 1956

Edward W. McCloskey	May 11, 1931	June 16, 1956
James R. Martin	March 5, 1941	December 26, 1956
Francesco Mogavero	January 7, 1948	July 23, 1956
George E. Pfahler	February 1, 1905	January 9, 1957
Rufus S. Reeves	May 11, 1925	July 13, 1956
James L. Richards	May 11, 1936	April 3, 1956
William Egbert Robertson	January 7, 1903	March 7, 1956
Henry S. Ruth	January 6, 1954	June 7, 1956
Mary Bickings Thornton	March 4, 1936	September 7, 1956
Stephen E. Tracy	June 3, 1908	February 22, 1956
Nathaniel W. Winkelman	April 7, 1948	February 13, 1956
Non-Resident Fellows		
W. A. Newman Dorland	October 6, 1897	September 11, 1956
David M. Shewbrooks	January 13, 1943	February 27, 1956

(*Suggested Form of Bequest*)

I hereby give, devise, and bequeath to The College of Physicians of Philadelphia, a charitable and educational association organized under the laws of the Commonwealth of Pennsylvania and the executive offices whereof are located in the City of Philadelphia, the sum of . . . . . .

a. which sum shall be used for the general purposes of said association;

b. which sum shall be added to and become a part of the general endowment fund of said association;

c. which sum shall be used by said association preferably for the following purposes:

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